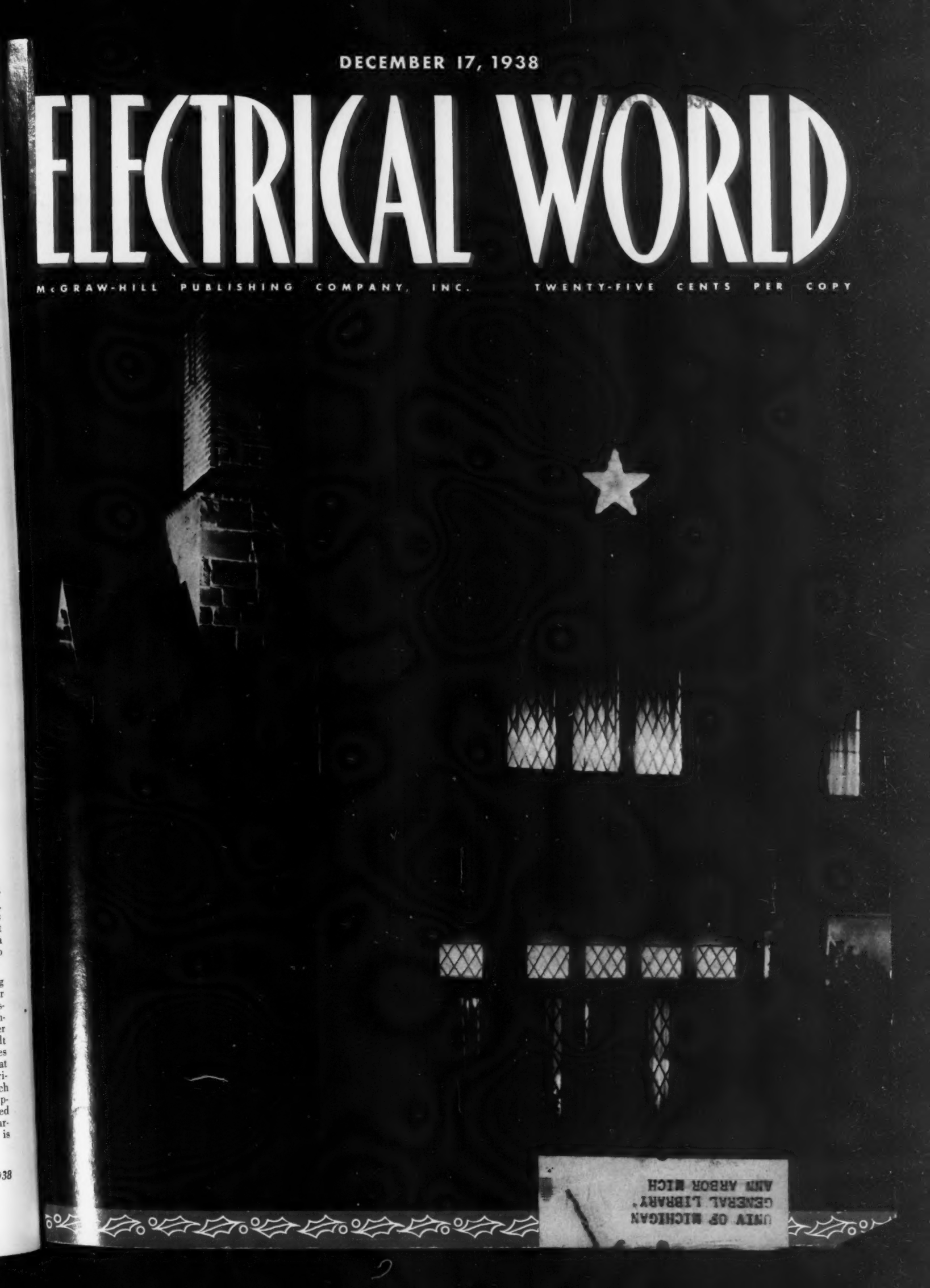
DECEMBER 17, 1938

ELECTRICAL WORLD

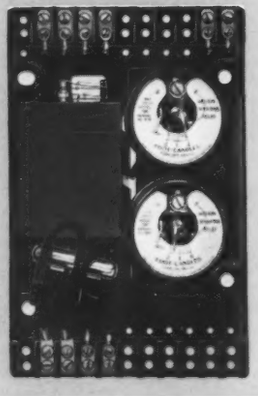
McGRAW-HILL PUBLISHING COMPANY, INC. TWENTY-FIVE CENTS PER COPY



UNIV OF MICHIGAN
GENERAL LIBRARY
ANN ARBOR MICH

AIR BEACONS...NAVIGATION LIGHTS on this new bridge are *photronically controlled

This new bridge spanning the Connecticut River at Middletown presents no hazard to air or river commerce . . . for all obstruction lights are Photronically controlled . . . automatically turned on at evening or during storms, before *nature's light falls to a level below the full visibility zone.*



WESTON *PHOTRONIC Illumination Control Relay

The most practical, most economical lighting control for streets, signs, airways, and for indoor use. Employs the lifetime, self-generating WESTON Photronic Cell. No amplifying equipment necessary. Cell can be mounted remote from relay cabinet. Permits independent setting of both the "on" and "off" illumination values. Uses no energy when not operating; consumes but 2 watts during a 1 minute operating cycle.

Here's another of the many installations where WESTON Photronic equipment was selected to control *safety lights* . . . again emphasizing the *dependability* of this automatic method of control. Other factors, too, which have led to the widespread use of the Photronic (photo-electric) method for controlling safety lights, as well as street, airport and other forms of lighting, are the *low operating* and *low maintenance costs* which this method provides. Complete information on Photronic Control, including operating and cost data on many installations, is available and will be sent on request. Communicate with the WESTON representative near you, or write to . . . Weston Electrical Instrument Corporation, 578 Frelinghuysen Avenue, Newark, N. J.

WESTON
Illumination Control

*PHOTRONIC — A registered trademark designating the photoelectric cells and photoelectric devices manufactured exclusively by the Weston Electrical Instrument Corporation.

Engineering Library

KNOWLTON.....Associate Editor
G. DOOLEY.....Associate Editor
WITTIG.....Statistical Editor
TON WHITE.....News Editor
RAYMER.....Assistant Editor

ELECTRICAL WORLD

FOUNDED IN 1874

CHARLES DE VORE.....Assistant Editor
FRANK R. INNES.....Western Editor
H. S. KNOWLTON.....New England Editor
WAYNE SNOWDEN.....Pacific Coast Editor
PAUL WOOTON.....Washington Correspondent

S. B. WILLIAMS.....Editor

W. K. BEARD, Jr.....Manager

DECEMBER 17, 1938

VOL. 110, NO. 25

CONTENTS

Reaching for Better Citizenship 26
By FRANK W. RANDALL, *New England Gas & Electric Association*

Power a Vital Tool in Crushed Stone Plant 29

Detroit Edison Has Modern Meter Department 31
By A. S. ALBRIGHT, *Detroit Edison Company*

Kitchen Plans Sell Major Appliances 34
By A. C. MCMICKEN, *Portland General Electric Company*

Rural Kva. Profitably Released by Capacitors 35
By F. M. STARR, *General Electric Company*

Increase Usability of Plant and Substation Capacity 37
By R. A. KELLER, *Central Illinois Light Company*

Condenser Supply Revamped for New Orleans Increment . . . 38
By LOUIS ELLIOTT, *Ebasco Services, Inc.*

Carter Field on Washington Events 42

Letters to the Editor	23	New Equipment Available	70
Editorials	25 and 40	Rural Allotments; Contracts Awarded	73
News of the Week	43	Manufacturing and Markets	74
Field Operating Practices	51	News About People	76
Industrial Electrification	58	Sales Opportunities	86
New Engineering Ideas	62	Recent Rate Changes	87
Building Up the Load	66	Municipal Plants	89

Index of Advertisements 92

Cover picture courtesy of Westinghouse Electric & Manufacturing Company

McGRAW-HILL PUBLISHING COMPANY, INC.

JAMES H. McGRAW, Founder and Honorary Chairman

ELECTRICAL WORLD—Published weekly. Price 25 cents a copy. Subscription rates: In the United States, Canada, Mexico, Central and South American countries, $4 a year; all other countries, $6 or 24 shillings a year. Entered as second-class matter November 16, 1936, at Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in U. S. A. Contents copyrighted, 1938, by McGraw-Hill Publishing Company, Inc.

Branch Offices: 520 North Michigan Ave., Chicago; 883 Mission St., San Francisco; Aldwych House, Aldwych, London, W. C. 2; Washington; Philadelphia; Cleveland; Detroit; St. Louis; Boston; Atlanta, Ga.

Cable Address McGRAWHILL, New York.

Publication Office
99-129 North Broadway, Albany, N. Y.
Editorial and Executive Offices
330 West 42nd Street, New York, N. Y.

JAMES H. McGRAW, JR.....President
HOWARD EHRLICH.....Executive Vice-President
MASON BRITTON.....Vice-Chairman
B. R. PUTNAM.....Treasurer
D. C. McGRAW.....Secretary
J. E. BLACKBURN, JR.....Circulation Manager

Member A.B.P. Member A.B.C.

A McGRAW-HILL PUBLICATION

OKOLITE

Resistant to HEAT·MOISTURE·CORONA

A dramatic picture but it shows the destructive processes going on in rubber-insulated cables when the wrong insulation is subjected to corona and extremes of temperature and moisture.

Okolite insulation handles these conditions. It is effectively resistant to heat, moisture and corona. Where it is desired to avoid having a lead sheath, Okolite is *the* satisfactory insulation.

Okolite insulation meets exacting laboratory tests and is backed with an impressive performance record. Millions of feet of Okolite insulated cable are operating in diversified use throughout the country.

Okolite insulation can effect large savings in plant construction and maintenance. A study of Okolite characteristics and performance will show the wide usefulness of this insulation. Its scope ranges from a small control cable to heavy generator leads —or a submarine power cable.

1938 Marks Our 60th Year of Service

THE OKONITE COMPANY

Founded 1878

EXECUTIVE OFFICE: PASSAIC, NEW JERSEY

HAZARD INSULATED WIRE WORKS DIVISION

New York · Philadelphia · Boston · Los Angeles · Seattle · Pittsburgh · Buffalo

THE OKONITE-CALLENDER CABLE CO., INC.

Chicago · St. Louis · Dallas · Washington · Detroit · Atlanta · San Francisco

OKONITE QUALITY CANNOT BE WRITTEN INTO A SPECIFICATION

Letters TO THE EDITOR

A Power Factor Formula

To the Editor of ELECTRICAL WORLD:

In connection with the approximate determination of the power factor of a balanced three-phase circuit, from the ratio of the two watt readings (the two elements of a polyphase meter or two single-phase meters), why not use the formula

Power factor (in per cent) equals

$$50\sqrt{\frac{(1+A)^3}{(1+A)^3}}$$

Where A is the ratio of W_1/W_2

and $W_1 < W_2$

This compares with our "old friend"

$$\text{Tan } \theta = \sqrt{3\,\frac{W_2 - W_1}{W_2 + W_1}}$$

The former is simply a transformation from the identity

$$\text{Sec}^2\Theta = 1 + \tan^2\Theta, \text{ etc.}$$

I have used the former for some twenty years, and as it is an easy formula to remember the calculation is simple, with the help of a pocket slide rule, although apparently the latter formula, requiring the availability and use of tables, still seems the only one known, in general.

C. O. VON DANNENBERG,
Tulsa, Okla.

•

Needs Encouragement

To the Editor of ELECTRICAL WORLD:

I have just noted the editorial in the ELECTRICAL WORLD of October 22 entitled "How Can Employees Believe Unless Executives Have Faith" and wish to advise that it is one of the best that I have noticed in recent years in your publication.

As I have often expressed, I believe the critics of our industry get many of the ideas from trade publications, and that when their editorial policy scolds the industry because it is not doing a good enough job or does not have enough salesmen or is not keeping every iron cord repaired, they supply the thought and ammunition for these critics. Remembering that public enterprise makes no effort to build the market and is notorious for its non-service policy of customers' equipment, it has always irritated me to see the industry criticised because it fell a little short of the mark.

Competition is forcing low unit prices and the private utility will probably be forced away from even the present service and sales policy in order to save the expenses attendant.

G. A. NEAL,
President and General Manager
Iowa Public Service Company.

•

Tree Article Constructive

To the Editor of ELECTRICAL WORLD:

I am especially pleased with the article "Urge Tree Planting on Private Property" in the October 29, 1938, issue of ELECTRICAL WORLD for several reasons:

1. It gives recognition to the International Municipal Association, which represents municipal electrical services of which too little is known or appreciated by the public.
2. The caption is so much more appealing than that used by our local press, which conveyed the idea that the N.E. Section sought to abolish public shade and ornamental trees.
3. The emphasis which is placed in the hope that a widespread movement in location and the species planted is most commendatory.

I am quite positive that our tree wardens and arborists are taking notice, which should be dispensed cautiously but in larger doses, until the public is not aroused, but effectively sold. An editorial in last Sunday's Boston *Post* to the effect that our cities might well consider the matter was timely.

Tree problems of the wire-using utilities are of such magnitude that an appropriate editorial should generate some straight thinking and better co-operation.

H. L. JONES,
Program Committee
N.E. Sect., International
Municipal Signal Assoc., Inc.,
Boston, Mass.

•

Politicians Notice Accidents, but Not Lights

To the Editor of ELECTRICAL WORLD:

This is to express my appreciation for the very fine handling of the article on the sodium-lighted intersections (August 27 issue). We expected you to do a good job, but maybe not to get us on the front cover.

An amusing sidelight on the situation is that a short time ago several of the ward politicians from the district in which the 79th and Stony Island job is located were in to see Leslie Sorensen, the traffic engineer for the city. What they came for was to find out why, at this intersection, traffic accidents had dropped to less than one-half, while at similar intersections accidents were climbing. Mr. Sorensen asked them if they knew about the sodium lights at that corner. No, they hadn't noticed the lights.

When the twelve months are up we expect, at the present rate, to make a very good showing at these places, and if there is anything radical that comes out of it I will be glad to let you know.

EDWIN D. TILLSON,
Commonwealth Edison Company,
Chicago, Ill.

•

Night Photographs Flatter?

To the Editor of ELECTRICAL WORLD:

Permit me to compliment the ELECTRICAL WORLD and Mr. Boast on the article "Combination Units Light Arterial Underpass," on pages 50 and 51 of your November 5 issue. All essential items of information are given in detail in the sketches and tabulation, permitting the text to be brief and to the point. The only possible criticism might be directed to the photograph, which gives the impression of road brightness much greater than probably exists. The difficulty in taking really representative night photographs is, of course, generally recognized.

KIRK M. REID,
Illuminating Engineer,
General Electric Co.,
Nela Park, Cleveland.

To the Editor of ELECTRICAL WORLD:

Mr. Reid's criticism of the impression of road brightness of the headpiece of the article "Combination Units Light Arterial Underpass" is fully appreciated. Night photographs seldom if ever accurately portray surfaces of such wide range of brightness as is encountered in such conditions. The vertical curvature of the street surface also has its influence on the visual impression of brightness one gains from this photograph. It suffices to say that the *uniformity* of pavement brightness is not unduly exaggerated.

W. B. BOAST,
Iowa State College, Ames.

1891
1896
1901
1910
1920
1938
KERITE
Out of the experienced past, into the exacting present, KERITE wires and cables, through three-quarters of a century of successful service, continue as the standard by which engineering judgment measures insulating value.
DAYS
KERITE
THE KERITE INSULATED WIRE & CABLE COMPANY INC
NEW YORK CHICAGO SAN FRANCISCO

ELECTRICAL WORLD

DECEMBER 17, 1938

Business Must Build on Today's Conditions

The National Association of Manufacturers in its annual meeting last week indicated that American business could go ahead. This is a rather remarkable statement in view of the fact that for year after year American business has complained that it could not progress until certain federal restrictions had been removed. It took courage and foresight and youth to insist that there could be no turning backward, that business to be reconstructed had to use as its foundation today's social and economic order

"This nation will not tolerate a return to the abuses that existed here and there in pre-depression days," said the N.A.M. spokesman. "Let us guard against complacency, overconfidence and backsliding."

American business thus is learning that in this country it can no longer run things to suit itself. It is now learning some of the lessons that the utilities learned long ago, namely, that it has a responsibility toward the customers, the employees and the investors. Because of abuses in the past business has been more and more regulated. These abuses, however, have been the sins of commission. There still remain the sins of omission to be solved. Government regulation is already taking care of some of these and will solve others unless business accepts its own responsibility.

Potential customers have the right to certain services. REA is one example of this. Business must decide its own limitations and not criticise government for doing the things that business could not or would not do in supplying certain services.

Employees have the right to work. Business must provide a reasonable continuity of employment or government will have to provide work relief. Business, however, will pay the bill, only the bill is much higher when the government provides the work.

Investors have a right to security of investment and continuity of return on their money. The former has already secured access to federal regulation through the SEC.

Business executives who cannot accept the permanency of the new order should step aside for younger men who are too ambitious to stand still or to go backward. Some members of the management group are inclined to let things drift in anticipation of a major political change in 1940. That is too long to wait. Now is the time to start reconstruction if business is to escape further conflict with government. And even if there is a different party in power two years from now, it is certain that the economic and social legislation, though modified, will not be repealed; that taxes will be no lower; that restrictions and regulation of business will continue; that government agencies will still flourish in equally large numbers. So, why wait?

The times present an opportunity for new business leadership. To agree on policies in convention is one thing, to put them into actual operation is something else. This is the leadership that big business must assume. Where it leads, others follow.

Today business has the public favor. That goodwill can be retained only so long as the public believes that business is accepting its responsibility. The next time that the public loses this confidence in business will mark the end of business freedom—that's how autocracies are born.

PUBLIC RELATIONS SERIES

Reaching for Better Citizenship

Progressive Utilities Meet Civic Challenge —Community Development Expands and Public Gains Through Co-operation

By FRANK W. RANDALL

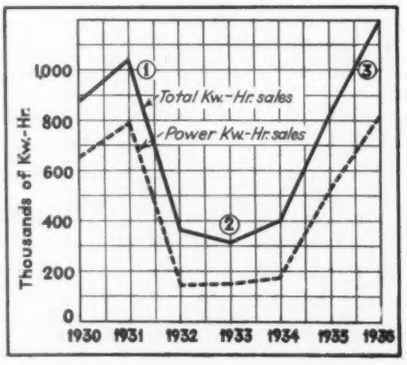
Assistant to the President, New England Gas & Electric Association, Cambridge, Mass.

HOPE and encouragement in the current public utility outlook can be attributed to many causes, but among the foremost of these it is fair to say that a new sense of civic responsibility on the part of company managements is of primary importance. We have come a long way since William H. Vanderbilt's classic blunder with his "the public be damned." True, he had been goaded to the bursting point by an over-insistent newspaper man, but the outbreak could never have been effectively exploited if the railroads of that distant day had not created a situation in which the sentiment became usable.

During the later muck-raking era there was also provocation for attacks which shook popular faith in business. Such attacks have continued from time to time down to the present day and have been accompanied by a trend toward greater social and political control, which means that the modern business leader must achieve a greater awareness of his responsibilities from the community standpoint. It is heartening to observe a growing recognition of this thought in the electric power industry, accompanied by specific actions to strengthen friendly relations between these utilities and the public.

While most utilities have done a good job in carrying out their charter obligations of good service at reasonable rates, this is insufficient to insure good public relations today. To meet the trend toward greater social and political control the companies must (as many are doing) develop goodwill activities in their communities which go far beyond the legal interpretation of obligations. A type of activity must be developed which will build each operating company into the life of the community served and create an understanding by citizens that here is no cold-blooded absentee ownership corporation desirous only of collecting as many dollars as possible, but a very human institution which is an active part of the community, seeking to contribute to its general upbuilding.

This is not a campaign type of high-pressure activity. It is, rather, a day-by-day, year-by-year program which must be developed slowly and be cumulative in its results. In its broadest aspects, community development work means that the utility takes its place in civic and economic life, working hand in hand with local groups and realizing that increased prosperity for the community means additional business for the company. The work proceeds along industrial, agricultural and recreational lines and goes beyond the promotion of manufacturing plant location and expansion only, important though that is.



Rescue work at Newmarket, N. H.

Kilowatt-hour sales curves show (1) effect when major industry left town, (2) following period of severe depression and (3) period of recovery exceeding previous peaks.

Sharing in civic tasks

On the New England Gas & Electric Association system of properties this co-operation assumes that first and foremost the fundamentals of good public utility operation are essential in the various companies, with good service fairly priced, courteous treatment of the public, loyal employees who are good citizens as well, and the constant development of physical equipment to serve expanding community needs. The community development work calls for keeping in constant touch with civic agencies, regional, manufacturing, recreational and agricultural associations. If the company expects to take its place in community life it must be represented in all these organizations, doing its share with others in their maintenance. Nay, more, a vital part of the work is also tied into community and regional planning, and this applies to public improvements involving such things as harbor betterments, provision for major bridges and highways, river channel deepening, and in general all projects concerning the welfare of the community in which every citizen is or should be interested.

In the New England system com-

munity development work is emphasized by the association management at Cambridge, Mass., and encouragement is given to employees assisting in the work on the various properties in that city, New Bedford, Worcester, Portsmouth and elsewhere. Subsidiary property managers and their power sales divisions are specially interested in this work, as are rural development and sales forces in general. Our engineering department at headquarters and in the field cooperates effectively both in connection with the study of proposed public works improvements and industrial developments in the several communities. In some cases commercial or domestic salesmen are in close touch with agricultural and recreational developments, and building construction activities of course are vitally important to the local utilities as well as to community progress.

The keynote of the entire program is co-operation. We do not seek acclaim as the originators or even as the joint promoters of community development. Quietly and helpfully we seek to put a shoulder to the wheel, looking toward the resulting successful upbuilding of the community and the friendly regard of its people as our reward from the public relations standpoint. Naturally, if the community prospers, we do also, and over a period of years a positive share in our company growth can properly be attributed to our company efforts as a community citizen.

Industrial growth vital

On the whole, industrial development is one of the important activities in community upbuilding in which these utilities participate. This embraces assisting existing industries to insure as far as possible successful operation, and the rehabilitation of vacant plants. In this second activity lies the greatest opportunity for a local company to contribute to the cause. Through affiliation with the civic organizations and the active participation of its designated representatives it assists in formulating the community plan for industrial development. In co-operation with other agencies it helps to crystallize community sentiment behind the plan. Through its engineering department it co-operates in such matters as cost of repairs or changes necessary in connection with vacant buildings, heating and power supply problems.

If problems of community financing are involved the company contributes advice and assistance through its accounting and financial departments. It also does its share of any necessary financing, can be and is helpful through its wide contacts and facilities in locating the right type of industry for the building and for the community.

Benefits mutual

From the standpoints of the company and the community no type of activity can pay greater dividends to both. It brings increased industrial load, with resultant gains in commercial and domestic loads to the company; re-establishes taxable values and provides normal employment for men and women, which decreases the relief burden of the community.

Where industries are non-existent or of very small moment in a community the utility man works with the civic agencies in making long-range plans for the proper development of the area in order that it may attract an increasing number of tourists of the right type. Where farming predominates work is done along allied lines to assist the agriculturalist, co-operating with regional, state and county farm organizations and officials. Rural line extensions are worked out and the territory benefited. In numerous ways which may not bring measurable results in increased sales of gas and electricity, but which bring equally important results in good will, the community development work builds the company into the economic and social fabric of the community life.

The feeling is built up in the communities that the local company can be counted upon to furnish information, advice and co-operation in connection with all community development problems. All data and information regarding the community are available at the company's offices. Ex officio, as it were, the company takes part in Red Cross, Community Chest and other worthwhile drives. Gradually, without forcing matters, the continued practice of community development work builds up a record of achievement. The people learn that their utility company is willing to give as well as to receive; that it is taking its proper place in civic life and sharing in all constructive developments.

Through organized propaganda

Frank W. Randall

people have been led to believe that utility rates are high. There is a serious lack of knowledge regarding the utility industry and the part it plays in our present-day life. Sharing in community development provides opportunities for operating companies to clarify many of these issues and reveal the value of utility service. Our experience in this direction has been most encouraging.

Concrete results convince

During a five-year period more than 8,000 new jobs were created in communities served by the New England Gas & Electric Association. These jobs resulted from the location of 168 new industrial concerns in these areas. Our organization, through its operating companies, cooperated with the local civic organizations in securing many of these new industries. The increase in taxable values, the placing of so many workers on normal payrolls and the rehabilitation of whole towns is a matter of legitimate pride to all cooperators.

Each local property collects data and information regarding its own area, including existing industries, their production, payrolls, number of employees, and so on. Information about vacant factories includes photographs, plans, elevations, ownership, lease terms, purchase prices, power facilities, taxation and transportation. Community development divisions initiate programs, rather

than waiting for inquiries, and employees of subsidiaries are encouraged to help in every possible manner. The general result is that the movement penetrates the entire local utility, leading to employees taking more active parts in civic affairs and multiplying the service rendered to the public. Once again, however, let it be emphasized that public good will is a plant of slow growth (except in cases of such dramatic service as utilities in this section rendered in recovery from the recent hurricane).

Newmarket's recovery story

A good illustration of the value of community development work with utility aid is the town of Newmarket, N. H. The story is that of a place which literally pulled itself up by its bootstraps. Once a thriving textile center, it lost its only industry and faced the discouragements of the early depression years. This town reestablished its industrial life as a result of real leadership and community co-operation.

In 1929 the town had 3,500 people and a silk mill with 1,000 workers. The manufacturer consolidated operations elsewhere, leaving eight vacant buildings and nearly 300 vacant tenements. In a year more than 1,500 people left town. Newmarket became a deserted village, with no commercial life and such loss of taxes that school operation and road maintenance were difficult. A group of forward-looking citizens organized a chamber of commerce and interested a shoe manufacturer in a location. Early in 1934 the Newmarket Industrial Associates (incorporated just before 1934) purchased a vacant mill building for $20,000 with $1,500 down. The next day a shoe company moved in, planning to employ 50 people. The cost of preparing the building was arranged when some merchants agreed to contribute $1 a week for 50 weeks, while other citizens loaned their credit. Unemployed carpenters, pipe fitters and electricians contributed their services. The shoe workers organized an association to be part of the program, and the concern grew and increased its payroll. Later in the year a box factory and two small textile plants took space. Moving expenses and expansion financing led to the need of additional funds to complete the development.

During all this period the New Hampshire Gas & Electric Company, which serves the community, had been co-operating with the whole program. Representatives of the company had frequently attended meetings of the associates and the company was consulted about the emergency financing. It appeared that, in view of the real effort the community had made to finance the program, the company should now do its share in a tangible way. The company agreed to indorse the associates' note to cover the cost of bringing in the textile manufacturers, and also to indorse the associates' note to cover the amount necessary for shoe plant expansion. The textile plants moved in and the shoe plants expanded. New industries were located on the property.

By the middle of 1937 a substantial sum had been paid off. In the property formerly occupied by a single industry there were a shoe concern with 800 employees, three textile plants, a box factory and a woodworking concern, bonded warehouse and a distillery. The utility power load equaled that of the textile mill in 1929, and about 300 domestic customers were re-established. The accompanying load curves clearly reflect the effect of the new industries on the utility system.

Reciprocal community development

In 1937 a plan was put into effect under which utilities and service organizations in New England and in Florida agreed to promote each other's areas for vacation purposes alternately in winter and summer, so that the recreational businesses of each area and the communities themselves might benefit from this seasonal co-operation. The scheme worked so well that it has been continued in 1938.

The utility companies involved exhibit in their offices in ten Florida cities a New England diorama and distribute New England recreational literature. The New England Gas & Electric properties display in return photographic and other material featuring the winter attraction of Florida. Newspaper releases were prepared for each region and press and civic organization representatives made fully acquainted with every phase of the plan. The Florida Power Corporation, the Florida Public Service Company, and the New England properties shared the program. In Florida displays of New England

[*Continued on page 80*]

New England window display in Florida company's offices in summer and Florida attractions displayed in New England companies' windows in winter

Power a Vital Tool in Crushed Stone Plant

Power Supply and Utilization in This Country's Second Largest Crushed Stone Plant

THOROUGH and effective use of electric power for both drive and control in industrial surroundings of more than usual severity marks the Stoneco plant of the New York Trap Rock Corporation on the Hudson River, near Beacon, N. Y. This crushed stone plant, the second largest in the country, has a capacity of 667 tons of crushed stone per hour, with the product ranging from sand to 2½ in. stone and riprap in sizing from 15 lb. to 12 tons.

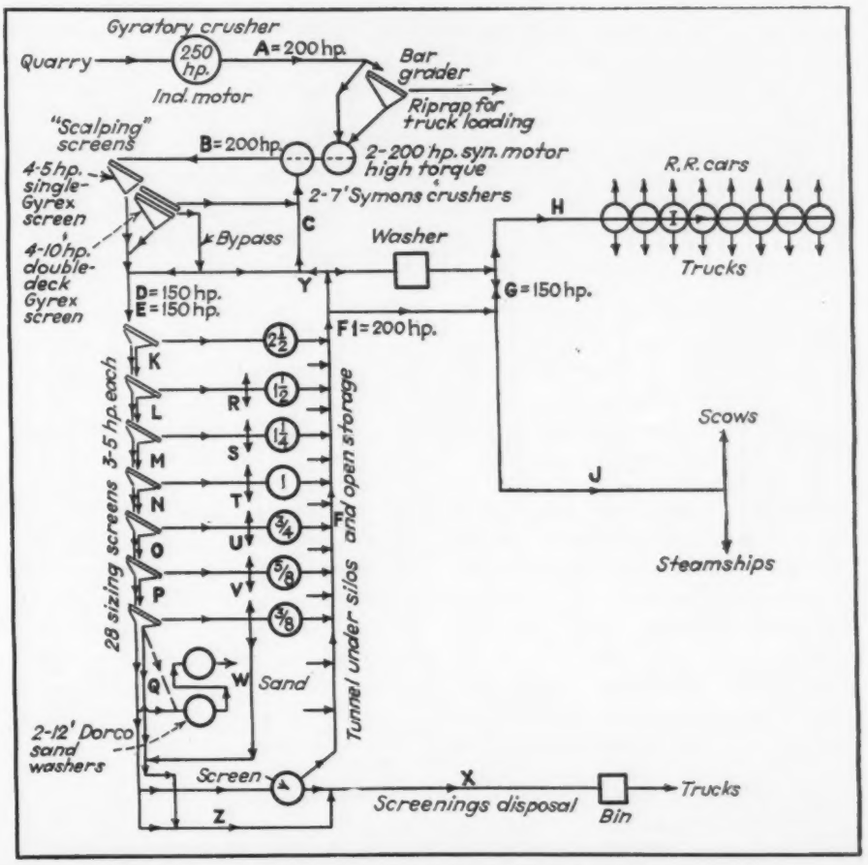
Noteworthy features of the plant include a modern industrial-type substation, electric drilling and quarrying equipment, a unique dual-motor conveyor belt drive scheme and its associated control for long, heavy-duty belts and a complete belt interlocking system.

Plant load

The plant, which has a connected motor load of 6,000 hp., has an average demand of 1,800 kw. and is served at 66 kv. by the Central Hudson Gas & Electric Company. The company-owned substation, shown herewith, steps the voltage down to 2,200 volts for distribution throughout the plant. Transforming is done in three 1,500-kva. delta-connected transformers. The 6,000 motor horsepower is in 185 units, ranging in size from fractional to 264 hp. Motors up to and including 20 hp. are served at 440 volts, while those over 20 hp. are supplied at 2,200 volts. Most of the more important motors are indicated on the accompanying flow chart that shows progress of the stone through the crushing, screening and storage departments of the plant.

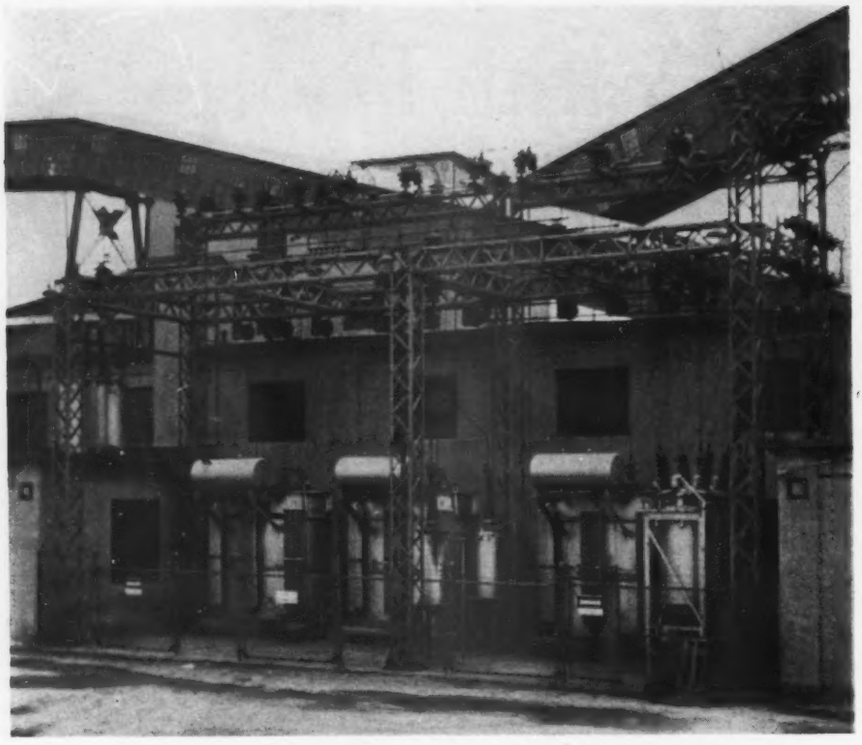
Electric drills and shovels are used in quarrying operations. Two Bucyrus 9-in., 20-hp., 440-volt well drills equipped with slip-ring motors drill blast holes at the top edge of the quarry face. These drills are supplied from an overhead secondary pole line running some 100 to 200 ft. back from the face of the quarry. At each pole location 440-volt heavy-duty plug outlets are provided for connection to portable drill cables. The 100B–185-hp. electric shovel operates at the base of the cut and is supplied with 2,200 volts by four single-conductor, 5,000-volt, rubber-insulated cables twisted together and lying on the floor of the quarry.

Use and location of these power cables subjects them to mechanical damage by trucks, stones or water, yet their life (about three years) is



Flow of material in country's second largest crushed stone plant

Rock from the quarry crushed to fist size in primary gyratory crusher passes to inclined bar-type size grader that passes all but large sizes for riprap. Stones passed go to Symons secondary crushers for further reduction, thence to inclined vibrating (gyrex) screens, where sizes 2½ in. and under are passed and larger ones returned to the secondary crushers for further reduction. Stone passing these so-called "scalping screens" is graded for market sizes in a series of vibrating screens and finally stored in silos or piles. A tunnel under the silos houses a conveyor on which various stone sizes can be discharged. This stone is taken, with or without washing, to scows or railroad cars via a reversible belt (*G*). In all there are 42 screens and 34 conveyors in the plant. Not shown are a 264-hp. synchronous air compressor motor, a 200-hp. squirrel-cage water pump motor and a 150-hp. sand-pump motor.



Plant substation steps down 66 kv. to 2.2 kv.

Incoming 66-kv. line enters the substation at right, passes down through to main oil circuit breaker and up to a high-voltage bus. From this bus taps go to air-break switches atop the structure, thence through chemical fuses to primaries of the three three-phase, 1,500-kva. transformers with oil conservators.

reported to be satisfactory, and though they cause occasional trouble it is not sufficient to cause them to be discarded in favor of some other method of supply. Heavy-duty fused disconnects protect the system from the effects of cable faults; these are mounted on the last pole, nearest the shovels.

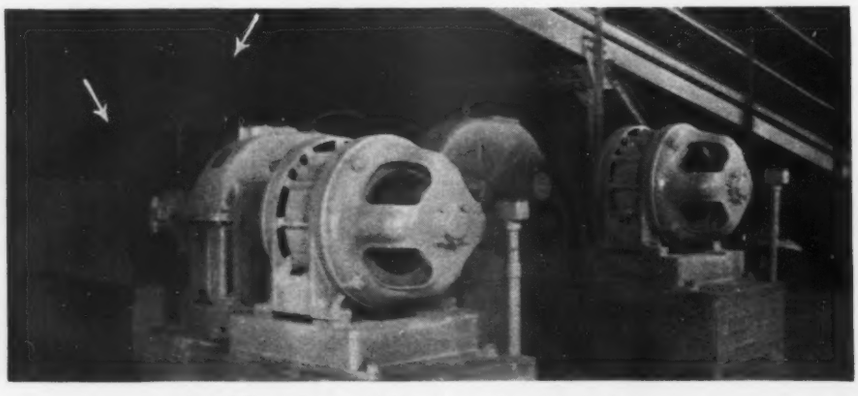
A special "dual-motor" drive has been adopted for six of the more important conveyor belts to reduce wear arising from belt slip at the driving sheave. About twice the normal belt area in contact with a single drive sheave is secured by using two successive drive sheaves, side by side, driven in opposite directions at the same speed by identical slip-ring motors through speed reducers. The belt runs *over* each sheave as shown in an accompanying illustration. Any difference in sheave diameter, due to grit accumulations on the surface of the belt, is inherently corrected by slip in the motors rather than in the belt.

Motor speeds of 870 r.p.m. are reduced to a range of 25 to 50 r.p.m. for the various conveyors, by speed reducers. Mechanical interconnection of the drum controllers cuts out the secondary resistance in both motors at the same rate so that motors start up in step. It has not been found necessary to attempt speed control of the conveyors by means of the interconnected controls, as was originally planned.

Interlocking

In addition to undervoltage and overload protection on the conveyor motors interlocking is provided to prevent pile-up of material in case of local motor failure. Failure of any major piece of equipment, be it screen, conveyor, crusher or whatever else, stops all related motors back to the primary crushers. Emergency stop buttons are conveniently located along conveyor runs, from which the backward cascading interlock system can be hand tripped in case of belt breakage or similar accidents.

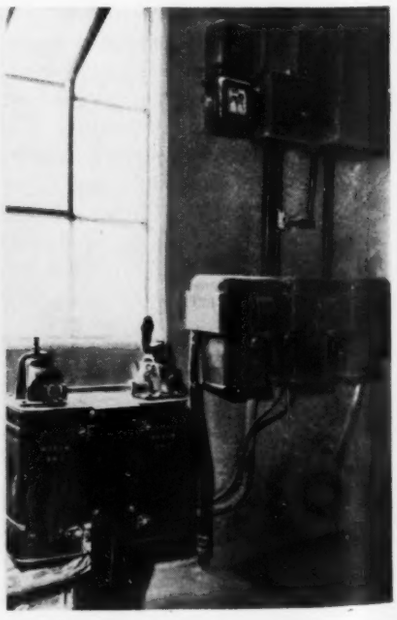
Until recently this plant's maximum demand for twelve months was used for billing purposes to set the demand charge for the next twelve months and therefore demand-limiting equipment was used. This was discarded recently with the change to a month-to-month ruling demand method of billing and as a consequence demand is allowed to be what it will in accordance with the dictates of operation. Billing is on a kva. basis with an assumed power factor of 80 per cent. Average energy consumption for normal operation is about 450,000 kw.-hr. per month.



Tandem conveyor belt drive cuts slip and wear

Empty conveyor belt entering the picture at the left passes over the second sheave, which rotates clockwise as viewed, and over the second counter clockwise rotating sheave at the left and on to the right. These motors are 75-hp. units operating at 870 r.p.m. and driving sheaves at 47.7 r.p.m. for a belt speed of 506 ft. per minute.

Interconnected drum controllers are also shown at the right. The center one of the three breakers at the right is ahead of the two others and provided with no-voltage release, while outer breakers, one for each motor, are equipped with overload protector. Relays for interlocking system are in box at upper right.



Detroit Edison Has Modern Meter Department

By A. S. ALBRIGHT
Superintendent of Meters, Detroit Edison Company

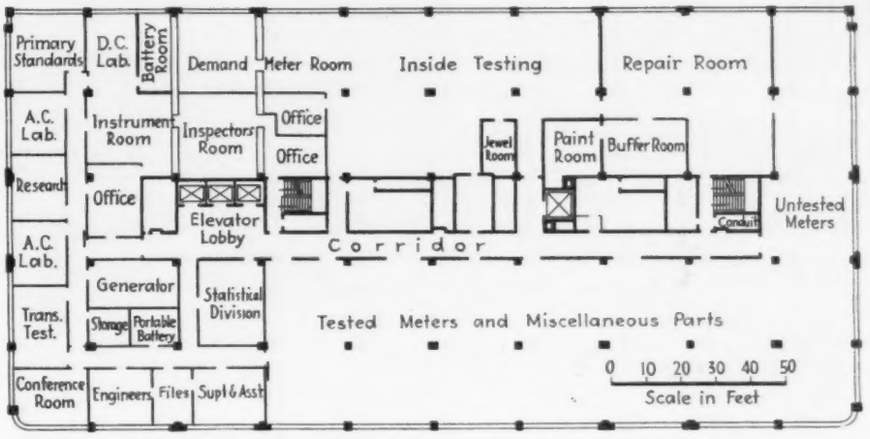
FEW motor departments in large electric utilities have had the opportunity to start all new, to lay out and provide facilities from knowledge gained in long operating experience. In most companies the meter departments have just grown, making the best use possible of piecemeal additions to space and equipment, with the result that functions are sometimes widely separated and are not often physically arranged and grouped for most efficient performance. But such an opportunity to build, figuratively, from the ground up did come to the meter department of the Detroit Edison Company.

When, in 1936, decision was made to erect a new service building adjacent to the general office of the company the heads of departments that would occupy the new structure were told to state their requirements and to supply layouts of the space and facilities they desired. With this information in the hands of the building designers, it was possible for them to, and they did, make plans from which resulted a building definitely intended for the functions housed in it.

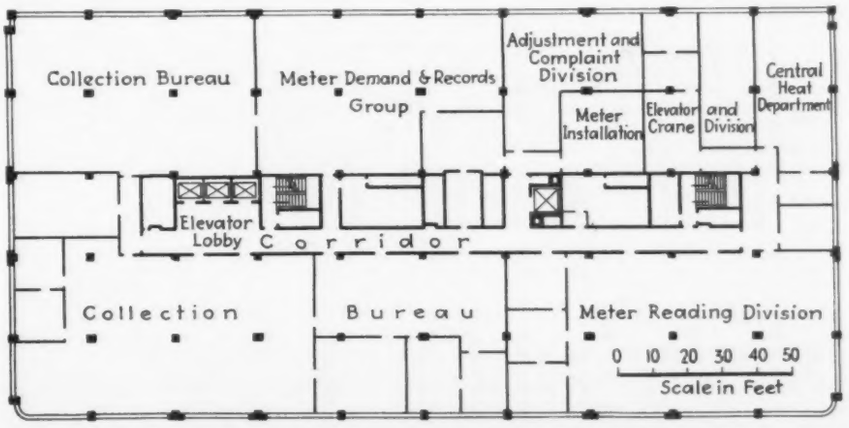
Examination of the accompanying plans of the two floors occupied by the meter and associated divisions and bureaus indicates that physical separation can never be pleaded as an excuse for failure of integration of functions or for lack of co-ordination of operations between these various groups.

Systematically arranged

Meter stocks and records, meter installation, reading and testing and the associated functions of collection and of adjustment and complaint are all close together. On the second floor, where are the testing rooms and standards laboratories, the principle of continuous production flow



Production flow determined layout of testing on second floor



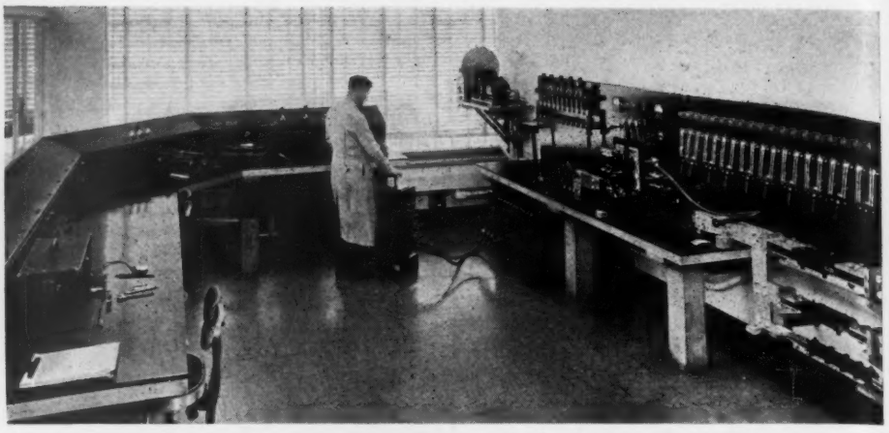
Third floor plan shows functional arrangement of meter records and associated activities

A corner of primary standards room

The concrete tables have non-magnetic reinforcing. Dead-front control switches are mounted on the aluminum and micarta panels on rear of tables. Note wire trough on wall below and in rear of table.

Non-magnetic test table with turret top control panel for general a.c. instrument and test meter testing and calibrating

Note rheostat and phase shifter controls under table top. Two such rooms are part of the standards laboratory.



General view of d.c. laboratory

Storage battery control panel on the right with heavy copper bus work and water rheostat. Synchronous timer for controlling test runs, mounted on bracket right rear. On the left is non-magnetic test table with controls.

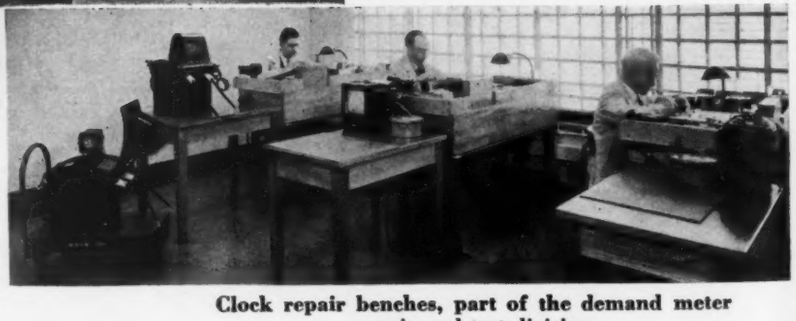
Shop testing

(a) On the right two new six-position gang test tables utilizing the "Unload System." On the left, two single-position test tables for general watt-hour meter testing. Note parts cabinet with mechanical register checker on top.

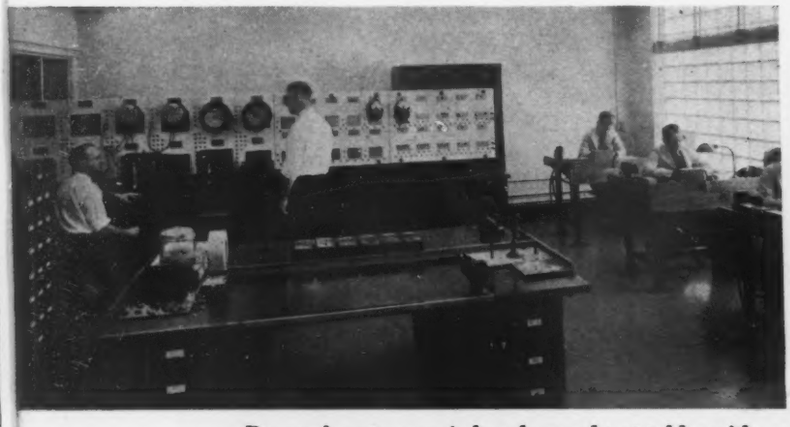
(b) In the foreground are three new type polyphase meter test tables, immediately back of which is the general d.c. meter test table. In the rear are shown three nine-position, single-phase gang test tables with parts cabinets at the ends of the tables.

is apparent from the layout plan. Untested meters move into the testing and repair rooms and then, ready for service, are carried across the corridor to stock. At the laboratory end of the floor production flow is not a primary consideration, and the first thought here was logical arrangement for convenience of direction and performance of work.

All laboratories have convenient access to the primary standards room in the corner and from his office in



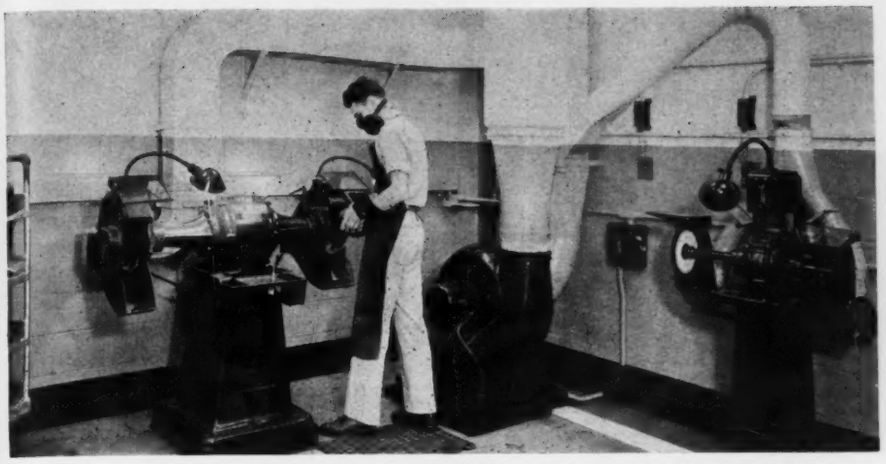
Clock repair benches, part of the demand meter repair and test division



Demand meter repair benches and test tables with special parts cabinets on the left

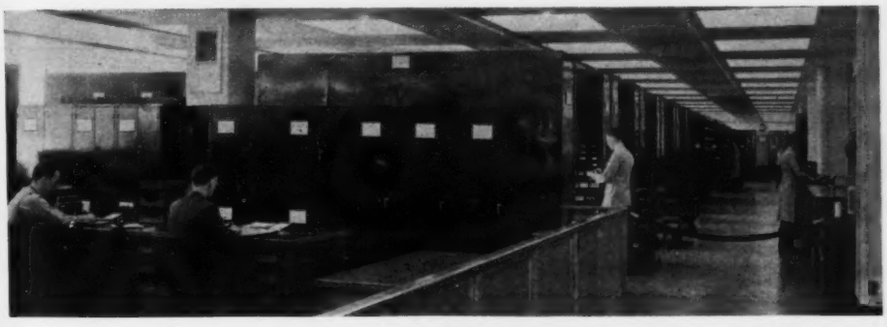
General view of meter and demand meter records division

Record card files are shown at the rear and left rear



Buffing and grinding machines with exhaust systems—part of repair division

Paint room of meter repair division showing well-ventilated and lighted spray booth with automatic sprinkler for fire control



Meter stock division—office in the foreground and parts cabinets, trucks, counters and rack in the rear

Stock division—steel meter racks with tested meters and meter trucks

the center the chief standards engineer can maintain close contact with all work under his direction.

A common feature observable in some of the illustrations is the lighting recessed in the ceiling. This manner of lighting is used throughout the building. It has proved particularly useful in the close work requirements of the meter department. Plenty of light and absence of visually obtrusive shadows prevent fatigue and improve accuracy in work with testing instruments and in fine repairing, which makes constant demand on the eyes of workers.

Meters are repaired at these tables

Before and after photos of a Portland kitchen remodeled from utility plans

Kitchen Plans Sell Major Appliances

By A. C. McMICKEN

General Sales Manager Portland General Electric Company, Portland, Ore.

AN ANALYSIS of the last two years' operation of our kitchen planning service indicates 1,559 plans prepared for prospects, 1.75 major appliances sold per plan drawn and an increase in load of 11.5 kw. per home for which plans were drawn. Eighty-five per cent of the plans drawn in this period were used in whole or part.

Planning as sales aid

Our company was one of the first to experiment with kitchen planning service as a sales aid to the company's appliance salesmen specializing in electric ranges, refrigerators, automatic storage water heaters and dishwasher sinks. When we started the service in 1934 we made use of manufacturers' kitchen planning departments. The time lag involved in this procedure, however, militated against sales and we decided to use our own engineering department for drawing these plans. Further, having found by experience that the average housewife could not readily visualize what a modernized kitchen would look like solely from blueprints of the floor and wall plans, we added to the service a colored perspective drawing. This was on May 1, 1936, and the analysis referred to above covers the period of the ensuing years.

The service has been made available not only to home owners desiring to modernize old homes but also to architects, realtors, contractors and speculative builders, and, more recently, to dealers in electric kitchen appliances. In the period referred to, 60 per cent of the plans drawn have been for new homes and 40 per cent for remodeling old kitchens. The appliances sold per plan drawn, given above, include sales by other dealers as well as by our own company sales force.

At the peak of the season seven draftsmen and one supervisor have been engaged in this kitchen planning work. When the service was first undertaken the cost ran from $8 to $10 per plan, but this cost has lately been reduced by standardized methods, so that plans are now costing about $7 each. So many have now been prepared that some of those drawn for new homes can be used over again. Realizing that $7 is still rather high, we are working out a scheme to reduce this cost to around $5.

Promotion of the planning service to the public has been through newspapers, radio, window displays, truck banners and direct mail advertising. In the latter medium 300,000 pieces have been sent out. No special campaign has been employed to stimulate the use of this service.

Sells 192 appliances

To indicate how the service is now functioning, 216 plans were completed in the first four months of this year. Of these, 49 are for houses under construction in which there has been no opportunity to solicit the ultimate owner for appliance sales. Among the home owners utilizing the other 167 plans, 97 ranges, 49 refrigerators and 46 water heaters, or a total of 192 major appliances, have been sold. Of these, the company's sales force has sold 84 and other dealers have sold 108. As fast as the 49 houses under construction are completed and occupied, the owners will be solicited for the purchase of appliances, with the probable result that sales will be made, bringing the record for this four-month period up to our average of 1.75 appliances per plan drawn.

Rural Kva. Profitably Released by Capacitors

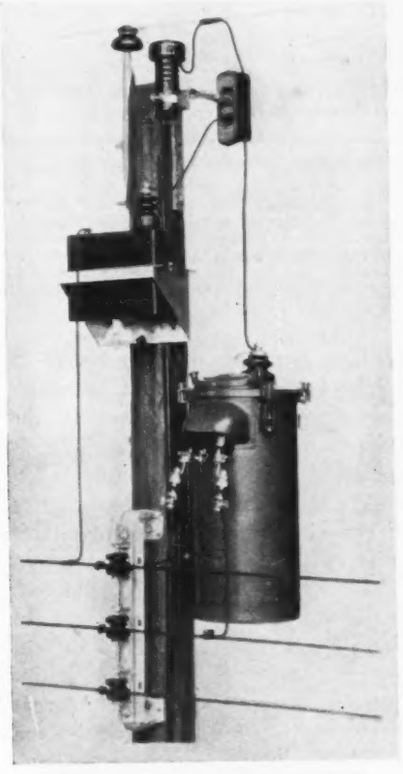
By F. M. STARR
Central Station Engineering Department, General Electric Company, Schenectady, N. Y.

A KVA. of capacitor does not release as many kilowatts on a rural line as on an urban feeder, but the kilowatts released on a rural line are worth in dollars considerably more. The return on the investment in capacitors for most rural lines is, in general, much greater than on urban feeders.

If a rural line is not loaded, obviously capacitors cannot be justified except on the basis of benefits derived elsewhere in the system. As the line becomes loaded, however, the capacitor lends itself particularly well to obtain the maximum line capacity at minimum cost. This is especially true of the longer lines having light load densities.

Increased carrying capacity

Increase in kilowatt-carrying capacity of the feeders is due primarily to the reduction in voltage drop resulting from the application of shunt capacitors. The increase is directly proportional to the voltage rise effected by the capacitor. In most cases this voltage rise can be calculated with sufficient accuracy by simply multiplying the capacitor current times the reactance of the line. On lines having small wire the reactance is somewhat greater than on lines having larger wire. This effect tends to increase the voltage rise produced by the capacitor and thus tends to increase the kilowatt-carrying capacity effected by the capacitor. On the other hand, there is an opposing effect produced by the resistance of the wire which tends to decrease the voltage rise produced by the capacitor. If the ratio of resistance to reactance of the line is greater than two, and if the value of IX very much exceeds about 5 per cent the voltage rise is no longer equal to IX, but something less than this. The relative errors in calculating voltage rise by the approximate formula are shown in Fig. 3.



Capacitor on solidly grounded common-neutral rural circuit
15-kva. capacitor with 2,300-volt rural-type transformer, cut-out and arrester.

There is another factor which must be considered. For a given amount of voltage rise, effected by capacitors, the increase in kilowatt line capacity is less for small wire than it is for large wire because a kilowatt of load consumes more voltage drop and more line capacity on a line with small wire than with one having large wire. Because of these several factors the impression has been with many operating engineers that although capacitors show great benefits on urban type of feeders, they cannot be justified on rural type of feeders which are characterized by small wire.

This viewpoint obviously has some justification. On the other hand, a fact which is frequently overlooked is that, although a capacitor releases less kilowatt capacity on rural line than the same investment would on an urban type of feeder, the value of this released capacity may be worth considerably more on a rural feeder. *A kilowatt of line capacity on a rural feeder can easily cost ten to fifteen times what a kilowatt of line capacity on an urban feeder costs.*

Rural characteristics

Rural feeders differ principally from urban feeders in load density, size of conductor and circuit voltage. In order to obtain an accurate comparative analysis of the value of capacitors on rural circuits an economic analysis was made with these three quantities as variables and most other quantities constant. Wire sizes considered were Nos. 6, 4, 2 and 2/0. Range in load density considered was from 5 kva. per mile to 100 kva. per mile. Circuit voltages were 2,300, 4,160, 4,600, 6,900 and 13,200.

All lines were assumed to be single phase, two conductor, of similar construction. The maximum allowable voltage drop in each case was assumed to be 10 per cent, and 80 per cent power factor was assumed in all cases. The amount of capacitor correction in each case was assumed to be 70 per cent of the peak reactive kva., this being about the right amount on the average feeder to correct out the average reactive over a 24-hour period.

The unit line costs used in making this economic comparison were:

No. 6 wire	$951 per mile
No. 4 wire	1,040 per mile
No. 2 wire	1,181 per mile
No. 2/0 wire	1,572 per mile

These values do not necessarily apply to any particular type of line or locality, but they are representa-

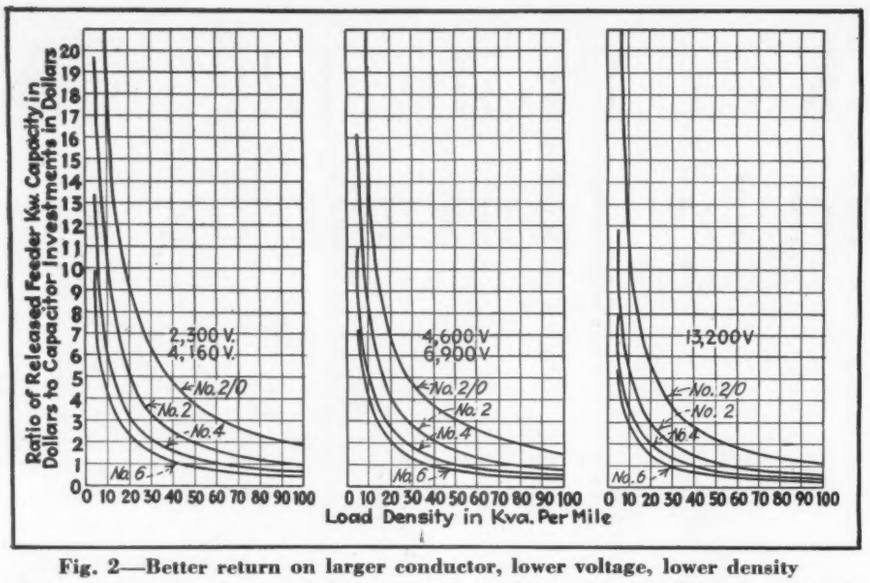
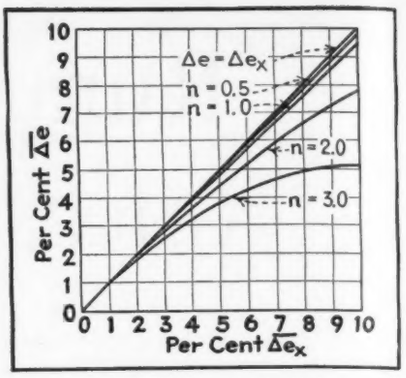


Fig. 2—Better return on larger conductor, lower voltage, lower density

Ratio of the value of released feeder capacity in dollars (per feeder) to the cost of capacitors installed (per feeder) is plotted against load density, conductor size and circuit voltage as parameters. Ordinarily it is not necessary to try to justify capacitors purely on the basis of increased feeder kilowatt-carrying capacity. Other benefits are usually evaluated, such as reduction in energy loss, increase in revenue and released system capacity at such points as the substation, the transmission line and the generator. However, it is the purpose of this analysis to consider only the relative comparison of released kilowatt capacity on the feeder.



$\overline{\Delta e}_x$ is the per cent IX due to capacitor current in terms of line voltage existing at the point of application of capacitors

$$\overline{\Delta e}_x = \frac{C\,Kva_a\,x_a\,d}{10\,Kv^2} \quad \text{.....(1)}$$

$$\overline{\Delta e}_x = 100 - \sqrt{100^2 - 200\,\overline{\Delta e}_x + \overline{\Delta e}_x^2\,(n^2+1)} \quad (2)$$

(1) = Approximate equation for voltage rise
(2) = Exact equation for voltage rise
(n) = Ratio of total line R to total line X

Fig. 3—Relative errors in calculating voltage rise

On rural lines having No. 2 wire or larger the error is negligible. On lines having smaller wire the error may or may not be negligible, depending on what the actual value of *IX* is.

tive figures and, comparatively at least, they are accurate.

The unit costs applying to the capacitors having various voltage ratings are, in dollars per kva.:

2,300 volts	$7.55	per kva.
4,160 volts	7.55	per kva.
4,600 volts	9.22	per kva.
6,900 volts	9.22	per kva.
13,200 volts	12.60	per kva.

The installed costs are based upon factory prices plus 20 per cent for installation.

Large return at light load densities

An examination of Fig. 2 shows, as would be expected, that capacitors give a greater return on the investment on large conductor lines than on small conductor lines. They show, further, that the return decreases as the load density increases. Furthermore, there is an increase in the return on investment as the circuit voltage decreases. This effect is entirely due to the variation in the price of capacitors at the different circuit voltages.

The significant fact brought out in the curves of Fig. 2 is that at light load densities, say from 5 to 10 kva. per mile, or less, the return on the investment is extremely large. A great many rural lines, particularly the ones being built in recent years, have load densities falling in this range. It is on such lines that the cost per kw. of line capacity is high. If capacitors can release a few additional kilowatts on lines of this class at a much lower cost per kw. they are a sound investment.

The following table summarizes the lengths of line, loading and other characteristic data for 4-kv. lines as used in plotting the curves of Fig. 2. For the other voltage classes plotted similar data may be quickly estimated, since length of line, kva. load and c.-kva. correction all vary directly with line voltage. The ratio of the value of released line capacity in dollars to the capacitor cost in dollars varies with line voltage only to the extent of the difference in cost per kva. of capacitors at different voltages. [*Continued on page 79*]

Value of Capacitors on 4-Kv. Single-Phase Rural Lines in Ratio to Released Line Capacity

Wire Size, No.	Kva. per Mile	Power Factor	Length *d*-Miles	Peak Kva.	Peak Kw.	C.=Kva.	Line Cost per Kw.	Released Line Capacity Kw.	Value of Released Line Cap.	Installed Cost of Capacitors	Ratio
6	5	0.8	12.52	62.6	50.1	26.3	$238	8.0	$1,905	$197	9.67
4	5	0.8	14.96	74.8	59.8	31.4	260	12.15	3,160	236	13.40
2	5	0.8	17.43	87.2	69.8	36.6	295	18.7	5,420	274	19.75
2/0	5	0.8	21.20	106.0	84.8	44.5	393	32.4	12,750	334	38.20
6	10	0.8	8.86	88.6	70.9	37.2	119	11.3	1,345	279	4.82
4	10	0.8	10.60	106.0	84.8	44.5	130	17.1	2,220	334	6.64
2	10	0.8	12.33	123.3	98.8	51.8	148	26.4	3,910	381	10.25
2/0	10	0.8	15.02	150.2	120.2	63.1	197	45.8	9,050	473	19.12
6	25	0.8	5.61	140.2	112.2	58.9	47.6	17.8	848	442	1.92
4	25	0.8	6.70	167.5	134.0	70.3	52.0	27.1	1,410	527	2.67
2	25	0.8	7.81	195.2	156.2	82.0	59.5	41.8	2,490	615	4.05
2/0	25	0.8	9.51	237.7	190.0	99.6	67.6	72.4	5,690	747	7.62
6	50	0.8	3.96	198.0	158.3	83.2	23.8	25.4	605	624	0.97
4	50	0.8	4.74	237.0	189.5	99.5	26.0	38.4	998	746	1.34
2	50	0.8	5.52	276.0	221.0	116.0	29.8	59.0	1,760	870	2.02
2/0	50	0.8	6.72	336.0	269.0	141.2	39.3	102.2	4,020	1,060	3.79
6	100	0.8	2.80	280.0	224.0	117.8	11.9	35.8	426	883	0.48
4	100	0.8	3.34	334.0	267.5	140.2	13.0	54.5	709	1,050	0.67
2	100	0.8	3.90	390.0	312.0	163.8	14.9	83.6	1,246	1,230	1.01
2/0	100	0.8	4.75	475	380.0	199.5	19.7	145.0	2,860	1,500	1.91

Increase Usability of Plant and Substation Capacity

By R. A. KELLER

Central Illinois Light Company, Peoria, Ill.

MAKING present equipment and facilities more useful is a less expensive way to add capacity to the system than to buy and build all new. This is the idea on which the construction program of the Central Illinois Light Company is based. The program has three divisions. The first is to utilize generating station oil circuit breaker and energy exit capacity to a maximum. Consequent on this is the second division, which requires the erection of switching stations at centers of heavy load areas. The third aspect is the revision of existing distribution substations.

Feeder arrangement

A number of 13.2-kv. feeders for distribution and for substation supply are taken from the generating station bus. These positions are equipped with 500-amp. oil circuit breakers. The loads on the feeders were various, some of them much below the breaker capacity. This resulted in uneconomical use of breakers and of exit duct spaces and cables. By installing new and larger cables the exit and breaker capacities were more nearly matched and the output ability of the plant thus increased. This increased exit capacity of the generating station is in turn being matched by the building of more and heavier feeder lines to existing distribution substations and to the new switching stations, of which one, the Abington substation, is illustrated here. This is a typical installation built to make full use of generating station breaker capacity and to fortify service quality in a considerable area served by three distribution substations.

The two heavy 13.2-kv. feeders that enter this substation are carried over different routes. They operate in parallel and either one is sufficient for the load. From one of them is tapped an emergency connection to a distribution substation. This feeder thus acts as an emergency reserve for two service areas. The switching substation is of brick and concrete construction without windows and with only moderate ornamentation to keep cost to a minimum.

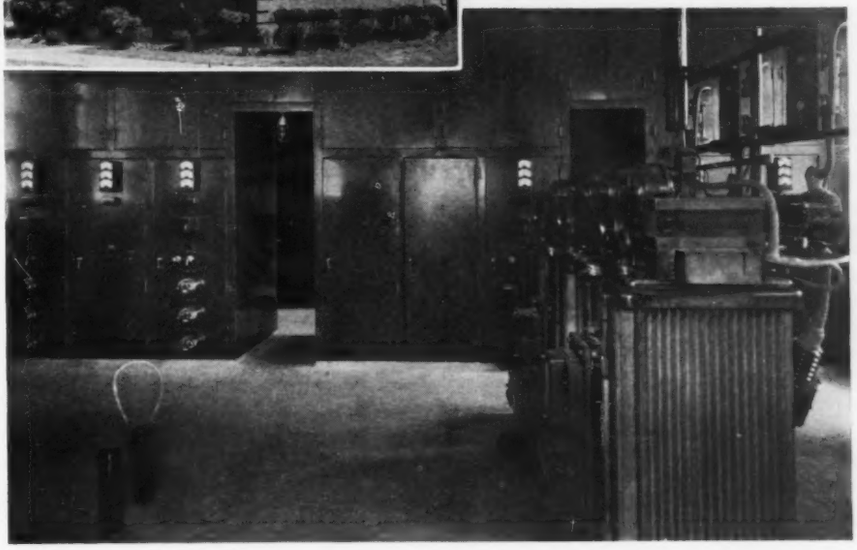
[*Continued on page 81*]

Switching substation

The simple function of the substation is expressed in the simple design of the building and arrangement of equipment inside.

Revised to double capacity

The small unroofed addition at the back, apparent from the lighter tone of the brick wall, incloses the transformers, which, removed from inside the building, left space for new equipment.



Condenser Supply Revamped

By LOUIS ELLIOTT
Consulting Mechanical Engineer Ebasco Services, Inc., New York

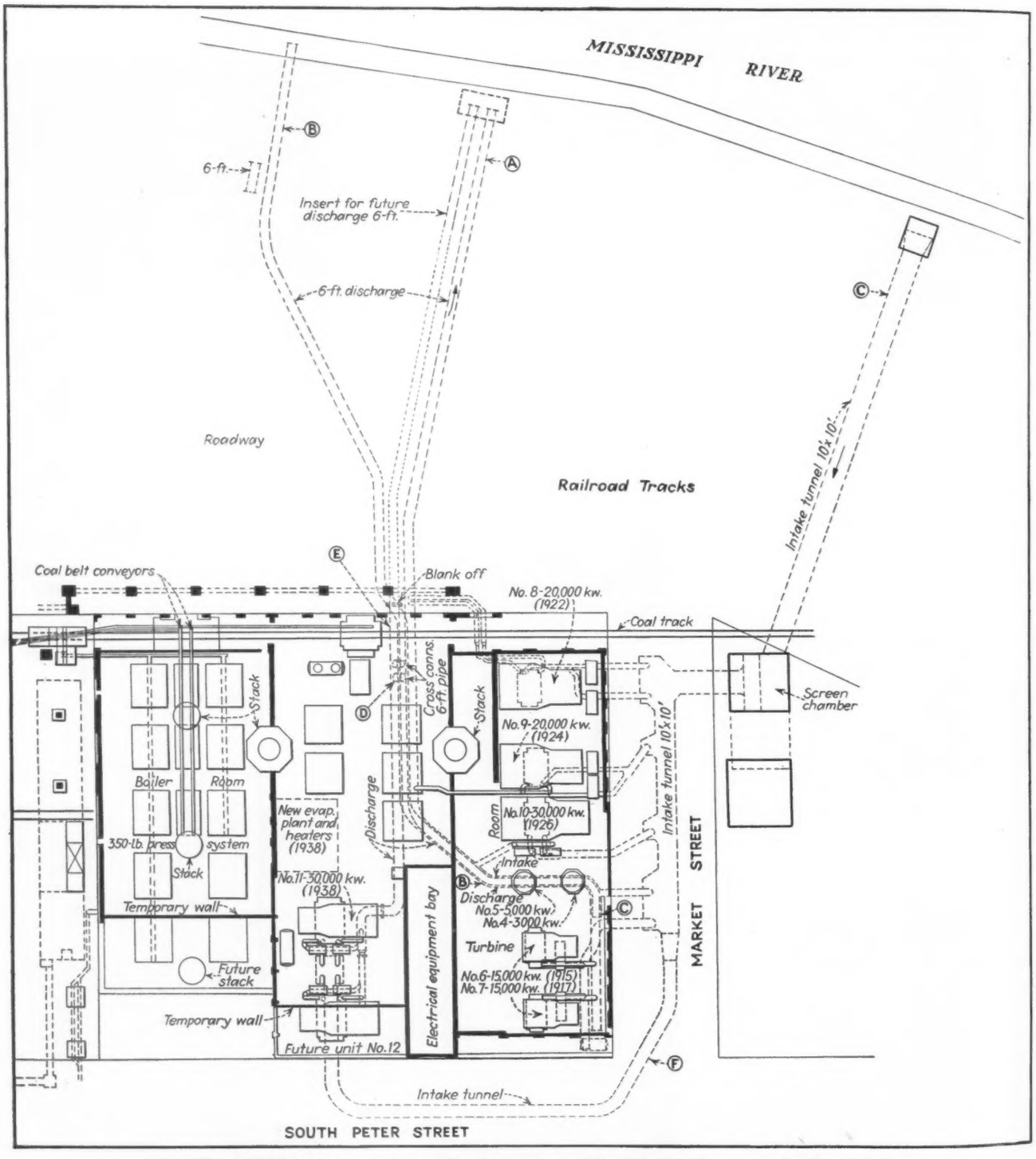


Fig. 1—Available pipes and tunnels adapted to enlarged supply of condensing water

New turbine unit (No. 11) is in a new structure between electrical equipment bay and boiler house, at one end of old boiler room, and new steam-generating unit (No. 23) is in southwesterly corner of main boiler house, adjacent to new turbine room. Space in westerly portion of old boiler house, labeled "New Evaporator Plant and Heaters 1938" is made available for new station auxiliaries by removal of an old 200-lb. boiler unit and rearrangement of piping.

for New Orleans Increment

Novel Method Adopted to Utilize Existing Tunnels and Pipes in Enlarging Condensing Water Capacity in the Market Street Plant

DURING the fall of 1936 it was determined that maintenance of firm capacity for increasing load in New Orleans and vicinity would call for an extension to power generating capacity of New Orleans Public Service, Inc., before the end of 1938.

After a careful analysis, comparing a number of possible plans of development, a 30,000/37,500-kw. condensing turbine extension, with 385,000 - lb. - per - hour boiler, was recommended and adopted. Steam conditions determined as most economical were 850 lb. gauge and 900 deg. F.

Turbine capacity of Market Street station is increased from 108,000 kw. to an effective 138,000 kw. by the new installation; this will take care of anticipated maximum-hour load for several years.

Comparison of development plans

Eight principal plans for providing additional system capacity were studied in detail and compared. Seven of these involved extensions to existing Market Street plant and one an entirely new station on a different site. Utilization of existing plant site, upon which facilities are available permitting substantial expansion of capacity, turned out to be much more economical than developing a new location. This is a conclusion frequently reached because of availability of spare capacity in various elements of actual power development, and of usual convenience of location of such an older plant with respect to distribution of energy. In case of the Market Street plant the location is within a short distance of load center, on the Mississippi River, on railway lines and near a natural-gas transmission system.

Present Market Street station is operated at two different sets of steam conditions—roughly, 350 lb., 700 deg. F. and 200 lb., 550 deg. F., respectively. For extension, various combinations of superposed and condensing turbine installations were studied. The latter turned out to be preferable, considering all requirements. Pressures studied for new extension ranged up to 1,250 lb.

For each of the eight cases analyzed a detailed construction estimate was prepared, total installed and firm turbine and boiler capacities computed, fixed charges calculated, distribution of load between various boiler and turbine units analyzed, operating and maintenance

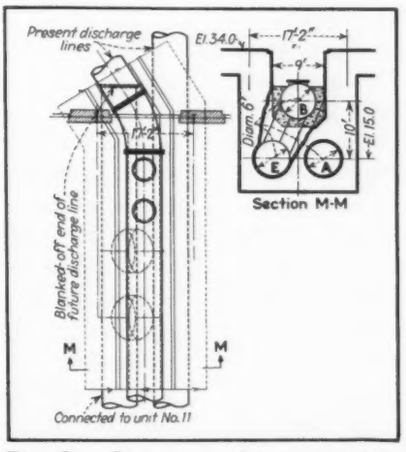


Fig. 2 — Cross-over pipe connections provide condensing supply for added capacity

costs estimated and total comparative energy costs, covering entire station output, computed. These estimates were made covering a period of five years, 1938 to 1942 inclusive, based on anticipated kilowatt and kilowatt-hour loads for the station. Adjusted figures were also made for varying costs of fuel.

The case was a complicated one and consideration had to be given to a number of collateral factors, including such elements as necessary removal and retirement of certain of the older pieces of equipment. Usefulness and economic value of such older equipment for seasonal peak-carrying purposes and for emergency standby during annual overhaul of major units is too often lost sight of; throughout the history of Market Street station, this has always received careful consideration and it accounts in large measure for the irregular arrangement of buildings and for the variety of existing apparatus.

Extension design adopted

As stated above, of plans studied the best from all points of view was the installation of a 30,000/37,500-kw., 850-lb., 900 deg. F. condensing unit, with one boiler. No spare turbine room space was available and a new turbine house had therefore to be built and space provided for new auxiliary equipment. In the existing boiler house space had been provided for additional 350-lb. capacity, and it was found possible to utilize this for the 850-lb. steam-generating unit.

General property plat and equipment layout is shown in Fig. 1; the site has ample space for good-sized development, including provision for fuel storage. New Orleans Public Service, Inc., owns five parcels of land along railway tracks and dock, bordering the Mississippi River, including four full blocks and one small triangular lot. The block occupied by the power station is now pretty well built up, the older turbine room being along Market Street on the southerly side.

Equipment installed includes a new-design, 3,600-r.p.m. turbo-generator, arranged for hydrogen cooling, with three-point extraction. Boiler auxiliaries include three 200,000-lb.-per-hour feed pumps, one

[*Continued on page 82*]

Editorials

S. B. WILLIAMS, Editor

Utility Business Interstate

THROUGH the Supreme Court decision in the Consolidated Edison labor board case virtually every electric utility became an interstate agency. Although the company does not sell energy for resale outside the state of New York, its 3,500,000 gas and electricity customers include three interstate railroads, an interstate vehicular tunnel, steamship piers, telephone, telegraph and radio companies, an airfield and federal operations including lighthouses, buildings and post offices.

"It cannot be doubted," the majority opinion declared, "that these activities, while conducted within the state, are matters of federal concern. In their totality, they rise to such a degree of importance that the fact that they involve but a small part of the entire service rendered by the utilities in their extensive business is immaterial in the consideration of the existence of the federal protective power."

Had the court arrived at its conclusion solely as a result of the supply of power to interstate railroads the decision would then have been limited to a few companies, but when it is broadened out to include electric service to telephone, telegraph and radio companies, to tunnels, piers, lighthouses, federal buildings and post offices it encompasses in one or more instance the operation of virtually every power company in the country. In other words, if this decision is carried to its logical conclusion, there could be no more so-called intrastate power company business, for what company does not supply one or more of the above-enumerated customers?

By thus characterizing electric utility service as interstate business the decision goes far beyond merely recognizing the right of NLRB to regulate labor relations. What activities, rates or service or extension, by this same reasoning, cannot become matters of federal concern? If the mere fact that a government post office, for the decision specifically denies that the ratio of the business to the total is material, makes a company's operations one of federal interest, surely there is no limit to which the national government can interfere with local business, be it utility or any other business.

This is probably one of the most important decisions of the Supreme Court. It would seem to have set a precedent, the effects of which can be far reaching, not only as regards utilities, but many other businesses that so far had considered themselves to be purely intrastate.

Strengthen Air-Conditioning Data

TO BE able to point to a high-grade installation benefiting from purchased power is always helpful in discussing proposed contracts with other customers in the same line. In the past a good many cases have been cited where an industrial executive has been convinced because a prominent factory elsewhere has signed up for central station service. This has been evident in the air-conditioning field, but the time is coming when more complete data will be needed to settle many border-line cases of industrial application.

Manufacturers of air-conditioning equipment possess exhaustive information, but as utility sales and promotion departments tend toward increasing interest in this field factual data, tests, studies of the requirements of specific processes, costs, limitations of temperature, humidity and air transfer values, measurements of volumes and knowledge of insulation progress become more and more important. It is not necessary for a power company to sell air-conditioning equipment to use always all the above type of data in effective promotion and co-operation with manufacturers. But as installations increase, opportunities for systematically gathering valuable design and performance material should not be overlooked.

•

Insufficiency of TVA Rates

EVEN after being subsidized by navigation and flood control, TVA's rates are said to be insufficient to cover expenses. Dean E. L. Moreland of Massachusetts Institute of Technology testified that when all dams were in operation the annual deficit would be ten millions, or 43 per cent. Former Chairman A. E. Morgan gave more than three millions deficit at present rates. On the other hand, J. H. Krug, chief power planning engineer for the TVA, stated that at present rates the project when completed would return an annual surplus of more than three millions.

What figure is the Congressional investigating committee going to take; that is, if it is interested? Here is a case of a government agency setting up policies that are destructive of private capital and which have been a definite handicap to the expansion of the entire electric utility industry. By means of its yardstick rate and the help of other government agencies public ownership with TVA supply has been set up in a number of Southern cities. If the TVA rates are too low, then they must be raised, unless the people in Rhode Island, for instance, are content to help pay the electric light bills of residents of Memphis and other Southern cities.

Here, after all, is the crux, not only of the TVA

situation, but of all government hydro operations. Are the rates adequate to pay all operating expenses and amortize the operation? Do the expenses cover all items, such as taxes? Is the allocation of investment properly made and does the investment account include all items of expense?

Who is going to determine the correctness of these expenses, allocations and rates? Certainly no Congressional committee can make such a determination unless it employs unbiased competent talent.

The committee has before it enough expert testimony on the inadequacy of the TVA rate to indicate that the TVA's own figures should not be accepted without competent outside check-up. If this is not done, the voters of the country are not going to accept any committee report that approves TVA operations.

The majority members of the committee and its counsel seem more inclined to accept TVA's own testimony and to defend the agency against statements made by others. The work of the committee, however, has not been in vain, for the public is getting a better conception of the economic weakness of TVA, and if the committee does not fully explore the rates and rate base the public will continue to question their validity until satisfactorily rectified.

•

Remove Barriers to Informed Personnel

IF STRAWS show which way the wind blows, may not many a trifling incident in utility operation point the way toward improvement in employee efficiency and public relations? Recently one of the most important hotel users of electric service in a metropolitan area suffered an open circuit in its kitchen supply. "This is Hotel 'X' calling," said a representative of the management to the trouble-shooting department of the power company. "We think a heavy fuse has gone in our range line and want a man sent over immediately." "Sure, we'll be glad to send a man," came the response, "but where is your place? I don't think I ever heard of it!" Of course, the address was given and the fuse replaced in short order, but the company staff members who contact the hotel regularly haven't heard the last of it, and probably won't for some time to come.

The lesson of this episode, for that is all it is, is the need of systematically acquainting the personnel of company repair forces in specified areas with the important new business added from time to time in those areas. In the case in point the hotel load had been acquired after long and arduous efforts by the sales organization in keen competition with fuel-burning equipment. From the top executive offices down a goodly number of company men had been in close touch with the job.

A good-tempered management would take the incident as a joke on the utility, but the episode illustrates the value of spreading information of company progress by definite and checkable means through all departments making contact with customers having significant loads.

•

Water Spray for Oil Fires

EFFECTIVENESS of properly applied water spray in extinguishing oil fires about electrical equipment has been demonstrated by both staged test and operating experience. This is a fortunate development in view of the relatively recent metropolitan utility fires and ever-growing recognition of reliability of service on the part of power utilities. These fires focussed attention on an element of weakness after much profitable thought had been devoted to rendering the systems substantially proof against recognized electrical mishaps. Purely electrical damage can often be repaired promptly, but fire and fire-extinction damage usually prolongs the interruption so the advantage in prompt extinguishment is primarily one of quicker restoration of service.

Definitely set aside is the long-standing aversion to use of water on electrical equipment. When applied as a finely subdivided stream or spray the quantity of water employed is enormously reduced, the drying out correspondingly shortened and the subsequent clean-up simplified. As for the electrical hazard, it has been demonstrated by laboratory tests here and abroad that conductivity practically drops to zero when a water stream is broken into spray. Certainly for outdoor fires where the equipment is designed for exposure to moisture it is safe to use spray.

Permanent fixed installation of nozzles properly disposed around transformer banks have been made, but it seems to be generally recognized that portable hose lines in the hands of competent fire fighters are a necessary adjunct of these fixed assemblies of spray nozzles. In fact, recognition of the varying wind, barriers, structural obstacles, etc., render standardized design difficult. As a consequence the installed costs entail a considerable amount of engineering and the unit prices are said to average about $0.50 per kva. protected. When the contribution to service reliability is commensurate such costs are not excessive.

How much prevailing measures for fighting oil fires give way to "atomized" streams depends upon many factors, such as cost, personnel, gains in service continuity, availability of assured water supply of ample pressure, structural makeup of existing electrical installations, etc. With the number of fixed installations alone already in the neighborhood of fifty, it is evident that the electrical industry has begun to lose its hydrophobia complex in connection with oil fires.

More Name Calling

By CARTER FIELD

This noted journalist gives his personal comments and interpretations on current happenings affecting the electrical industry. His background and his location at Washington make his thoughts informative and interesting even though all may not agree with him

IN HIS speech accepting the nomination for President of the United States at the Democratic national convention in 1932 Mr. Roosevelt was discussing the "piled up surpluses" which the corporations of the country had accumulated in the Coolidge years.

What had become of them, he demanded? Answering his own question, he said some of them had gone into additions to plant, which "are now standing stark and idle." And some of them, he said, "went in the call market."

"Nobody ever lost a nickel in the call market," observed a small business executive a little later. "There is no way to lose money in the call market. If the corporations Roosevelt was talking about put their money in the call market they got it back, and with a little interest.

"But what worries me," he continued, "is that this man is going to be elected President of the United States, and he said that absurd thing. What I want to know is, didn't he know any better, or was he just being a demagogue?"

Utilities called fascists

One is moved to the same wonder about remarks made a few days ago in the so-called TVA investigation by two members of the committee and one of the witnesses. There was the inquiry by Senator Harry H. Schwartz, who, notwithstanding what one may have read about him in this TVA business, is actually a very intelligent, likable person. Schwartz inquired if the privately owned utilities of this country were not fascist!

There was the answer of the witness, Representative John Rankin, of Mississippi, who eagerly replied that indeed they were. And there was the outburst of Chairman Vic Donahey, that the utilities had taken more money from the people of his state of Ohio than all the taxes they had paid put together.

Virtually every one who agrees with the government ownership ideas of Rankin, and a great many who do not go that far—that being quite a distance indeed—are outraged by the proceedings before another Congressional investigating committee, meaning the one headed by Representative Dies of Texas, which is looking into "un-American" activities.

Dies called reactionary

That man Dies, the liberals will tell you with some heat, sees communists under beds. He is absurd. It is reactionary and bourbon and all the rest of it to interfere with the right of free speech, to attempt to smear Harry Bridges and his friend Madame Perkins, etc.

In fact, the oldest Washington observer cannot remember a time when so much effort was made by an Administration and its supporters to ridicule a congressional committee headed by a chairman of the same party which controls the government. Incidentally the Administration just may have overrated the success of this sabotaging job on the Dies committee. At any rate no one seems to think that the President's pre-election denunciation of the Dies committee in connection with its attack on Gov. Frank Murphy of Michigan, done with the avowed purpose of helping to re-elect Murphy, helped Murphy very much. If it did Murphy must have been mighty weak to start with, for he was defeated by more than 93,000!

But the intriguing point here is just why it is reactionary and Tory to do a witch hunt on communist agitators and why is it liberal and progressive and in the interest of the people to set up straw fascists and knock them around?

No one would seriously contend that Shirley Temple had been damaged by the reference to her by one of the witnesses before the Dies committee, though this Shirley Temple instance is one of the big points of Dies' critics.

But the attack on the utilities of this country as being fascist may easily do a lot of harm. There is plenty of bitter feeling on this subject, and some people may actually believe that what the senator from Wyoming and the representative from Mississippi said was true!

Do they themselves believe it? Or have they just run out of adjectives? It so happens that this was the first new thing on the utilities that Rankin has said for two years.

Both Schwartz and Rankin make no secret of their belief that the owners of the private electric utilities are making too much profit out of them. So they would have the public believe that the utility owners would like to see a fascist system in this country. In which case the government would take all the utilities over, outright, or take all the profits.

Fascist side of TVA

If they had said that the institution the committee is supposed to be investigating, TVA, was fascist there would be some point to it, for TVA sets itself up as a benevolent autocracy, and does almost as good a job at taking all the profit out of private capital as the fascist governments in Europe. And if they explained just what the difference is between fascism and communism that would be helpful.

Getting around to the bitter tears of Vic Donahey over the looting of the Ohio folks by the utilities, one wonders. Latest figures are that 25 per cent of the total income of the country goes for taxes. Ohio may be below average, of course, though a superficial observer might think the contrary. One wonders also if Donahey carefully deducted from the Ohio electric consumers' tribute to the utilities the amounts which the utilities thereupon passed on to Washington, Columbus, county and local tax gatherers.

News OF THE WEEK

TVA Rejects Offer to Arbitrate Purchase Price of Utility Units

Willkie's proposal to have SEC or outside group set value of properties meets with objections of government power agency—Utility official would sell entire system—Value difference causes deadlock

Possibilities that the TVA will be up against strong private competition in the Tennessee Valley, with the investor and taxpayer paying for the ride, looms as a result of the rejection of the proposal that the purchase price of utility properties be subject to the decision of an arbitration board.

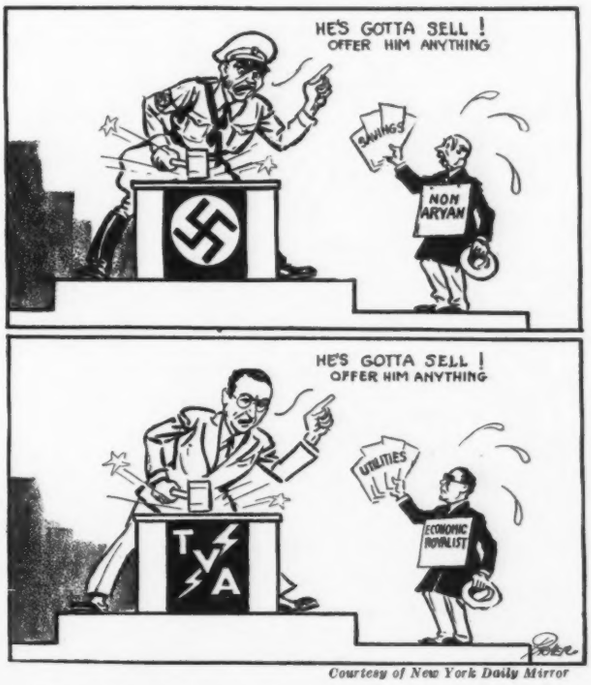
This week Wendell L. Willkie, president of Commonwealth & Southern Corp., again proposed and TVA again rejected that the fair value of utility facilities sought by the government agency be the subject of outside determination.

The situation is now in a deadlock and the number of possible solutions is being narrowed to only a few avenues of escape. Pressure is being brought to bear on the utility by TVA from many angles. The number of harassing attacks has increased of late, but both sides are holding to their guns.

Indications are that unless a "fair" price is reached the utility will choose to battle it out with the TVA and maintain its system in competition with government subsidized municipal plants selling TVA power.

With David E. Lilienthal, TVA power director, convalescing from undulant fever, J. A. Krug, TVA chief power planning engineer, is carrying on the testimony before the joint Congressional committee investigating the government power agency.

Mr. Krug, saying that he spoke for the TVA board, rejected the offer of Mr. Willkie to arbitrate the dispute over the sale of Tennessee Electric Power properties to the TVA by having the SEC or any other "impartial" tribunal determine the price. Mr. Krug said that the proposal was "loaded with jokers" and was intended to delay and confuse the issue.



Courtesy of New York Daily Mirror

"The 'smearing' tactics are the same in both cases"

Mr. Willkie, in a letter to Mr. Lilienthal, said that he would submit to his stockholders the proposal that a fair purchase price be fixed by arbitration. This was made to assure TVA that there would be no litigation on the part of stockholders if the results of arbitration did not please them.

The value of the Tennessee utility properties has been the basis of the dispute. An independent audit showed the value to be $94,000,000. TVA has offered $67,000,000. Mr. Krug put a value on the cost price basis of $81,000,000. He fixed the cost, less depreciation, at $57,000,000. To make up the difference in views between TVA and the utility over depreciation, Mr. Krug said that TVA had added $10,000,000 to the price.

TVA has sought to buy the Tennessee properties piecemeal, while the utility has stood firm that the system should be sold as an entirety, less operations be disrupted and investors made to suffer financial loss.

Representative John E. Rankin of Mississippi stirred the boiling pot last week by a series of charges against the utility industry which were quickly denied by Charles W. Kellogg, president of E.E.I., and Thomas W. Martin, president of Alabama Power, and Jo C. Guild, Jr., president of Tennessee Electric Power.

•

Hits TVA Pressure in Sale of Utilities

In its editorial "Forced Sale," of November 25, the New York *Daily Mirror* takes sharp issue with the policy of the TVA in forcing the sale of private utility properties under the threat of subsidized government competition and with PWA loans and grants.

The editorial says that "the TVA is using threats of government competition to force private utilities to sell out or be 'knocked out' in the Tennessee Valley area."

It points out that "if Mr. Roosevelt is sincerely interested in creating jobs

and in reducing electricity rates to the consumers, why doesn't he stop scaring private investors and thereby encourage the utilities to expand; to take advantage of low interest rates to borrow money and reinforce their whole structure; to pass along these savings in lower rates; to create the real jobs that will enable the government to shrink the WPA rolls and brag in 1940 that 'we have ended the recession'?"

•

Favors Power Units for Flood Projects

The Federal Power Commission has transmitted to the Secretary of War its recommendations for the installation of penstocks at four New England flood control reservoirs soon to be constructed. The provison in Section 4 of the 1938 flood control act directs that "penstocks or other similar facilities adapted to possible future use in the development of hydro-electric power shall be installed in any dam herein authorized when approved by the Secretary of War upon the recommendation of the Chief of Engineers and of the Federal Power Commission."

The four New England projects are located at Franklin Falls, N. H., in the Merrimac River Basin, and at Knightville, Mass., Surrey Mountain, N. H., and Union Village, Vt., in the Connecticut River drainage basin.

This is the first instance in which this provision of the act has been utilized.

•

Luckiesh to Address Meet

Matthew Luckiesh, director of Lighting Research Laboratories, General Electric Co., Nela Park, Cleveland, Ohio, will address the New York section, Illuminating Engineering Society, January 17, on "Quality of Lighting."

Will Enlarge Power Plant on Fox River

FPC has authorized issuance of a license to the city of Kaukauna, Wis., for a major hydro-electric power project on the Fox River within the corporate limits of the city. The license was ordered issued for a period of 50 years.

The project contemplates the repair, enlargement and utilization of certain existing facilities on the Fox River, a navigable water of the United States, and the construction, operation and maintenance of an overflow dam, and a power plant with an additional installation of 2,400 kw. and an ultimate installation of 6,000 kw. generating capacity. A substation and tranmission line connecting with the city's present power system nearby are also included.

The order stipulates that the city shall begin construction of the project works within three months from the issuance of the license and shall complete such construction, including the initial installation of one 2,400-kw. generating unit, on or before March 1, 1941.

•

A.I.E.E. Section Holds Convention in Miami

Problems of the engineering phase of the electrical industry occupied the attention of more than 300 delegates to the Southern district meeting of the American Institute of Electrical Engineers, held recently in Miami, Fla.

Edward E. George of Chattanooga, Tenn., superintendent of system operations of the Tennessee Electric Power Co., was nominated as vice-president of the Southern district for the next two years, subject to the national elections in the spring by the executive committee.

Talks during the meeting and technical papers read were by W. H. Rollman and F. J. Guice of Memphis Power & Light; H. V. Putnam and W. M. Dann of Westinghouse Electric & Manufacturing Co.; Llewellyn Evans and Robert H. Kirkwood of the TVA, and other power engineers. E. P. Almond of the TVA described the electrical design of the Pickwick Landing project of the TVA.

•

Suit Seeks to Block Cleveland Bond Sale

Efforts to block the expansion program for the Cleveland, Ohio, municipal light plant, which operates in competition with Cleveland Electric Illuminating Co., subsidiary of North American Co., are being taken in a taxpayer's suit filed in Common Pleas Court by Tolles, Hogsett & Ginn, attorneys representing George H. Charles, a taxpayer.

The expansion program provides for increasing by 75 per cent the capacity of the plant through expenditures of $5,447,000, of which $3,000,000 is to be provided by the city through the sale of mortgage revenue bonds. The balance is to come from PWA.

A referendum election has been called by the city for December 21. It is contended that the ordinance authorizing issue of the bonds was improperly passed by the City Council. The suit contends that the date of the election, if held, should be February 14.

•

Georgia Power Sales Off

Merchandise sales of Georgia Power for the first ten months this year totaled $1,554,125. During October the total was $136,116, the lowest in many months. A drive is now in progress to increase merchandise sales totals for the year through sales of washers, ironers, I.E.S. lamps and other appliances.

FLORIDA MEETING—Members of the Southern division of the American Institute of Electrical Engineers at their Miami, Fla., meeting, at which Edward E. George of Chattanooga, Tenn., was named district vice-president

Nebraska Power Purchase Probe Likely When New Congress Meets

Senator Bridges of New Hampshire asks members to investigate the actions of PWA in changing bond indenture and paving way for a $90,000,000 issue — Districts to buy Iowa-Nebraska Power & Light

An investigation of the approval of the PWA of the proposed purchase of private utility systems by the Nebraska power districts was demanded last week by Senator H. Styles Bridges of New Hampshire. In a letter sent to all members of the new Congress Senator Bridges demanded an inquiry of a $90,000,000 bond issue approved by PWA to finance the utility purchase.

"Is it not a fact that but for a combination of $90,000,000 worth of profitable private utilities with the $55,000,000 investment (part gift) of the federal government in these districts they would soon be known as the outstanding power folly of the New Deal?"

Ickes defends action

Secretary Ickes defended the action of PWA in amending its bond indentures to allow the Nebraska districts to obtain loans from private bankers. He asserted that the PWA had in no way approved the bonds but had assured itself that the private bonds would not endanger PWA bonds.

Senator Bridges charged that Guy C. Myers, financial agent of the Nebraska power districts, was to receive $2,250,000 as a "fee" in putting over the deal. He characterized the plan to purchase the private utilities as "a deal which PWA has just engineered with certain Wall Street bankers and a White House favorite 'financial wizard' to pull some of PWA's power chestnuts out of the fire."

The statement of Senator Bridges came after Secretary Ickes had announced that he had approved a change in indenture governing the $18,581,000 in bonds which the government holds on the two Nebraska districts involved in the deal. The PWA had also granted $20,190,000 to these units—the Loup River Public Power District and the Central Nebraska Public Power and Irrigation District.

Project state-wide system

The Nebraska power districts plan to issue bonds to finance the purchase of the Iowa-Nebraska Light & Power Co. facilities and to form them into a state-wide publicly owned power system. Charges have been made that the purchase of the profitable private systems will enable the public districts to "bail out" their unprofitable systems.

That the Nebraska public districts are not doing so well was indicated when Mayor M. B. Cummins of Ord said that the electrical service from the North Loup public power and irrigation district has not been satisfactory to consumers and the City Council has taken steps to protect the city's rights. Mayor Cummins said that the city had been taking power from the district since August 1 and has had a "lot of trouble" due to outages.

R. W. Hudson, president of the district, said that efforts were being made to reduce the number of outages.

•

Kentucky-Tennessee Purchase Sanctioned

Announcement has been made by the FPC that it has authorized, in the public interest, the sale by Kentucky-Tennessee Light & Power Company, Bowling Green, Ky., of certain of the company's electric facilities located in the northwestern portion of Tennessee within Lake, Obion, Dyer, Weakley, Gibson and Henry counties to the TVA.

In the same order the commission dismissed, for lack of jurisdiction, portions of the company's application relating to the sale of certain of the company's facilities to the city of Paris and the county of Weakley, Tenn., following a finding that the facilities involved are solely local distribution facilities.

Under an agreement dated October 6, 1938, entered into by the Kentucky-Tennessee company, TVA, Weakley County and the city of Paris (to which certain other communities were parties for the purpose of acquiring certain non-electric facilities), the company agreed to sell the facilities involved in the application, both electric and non-electric, for the aggregate amount of $992,000 plus other considerations.

The commission's order states that the authorization granted shall expire unless acted upon within 60 days.

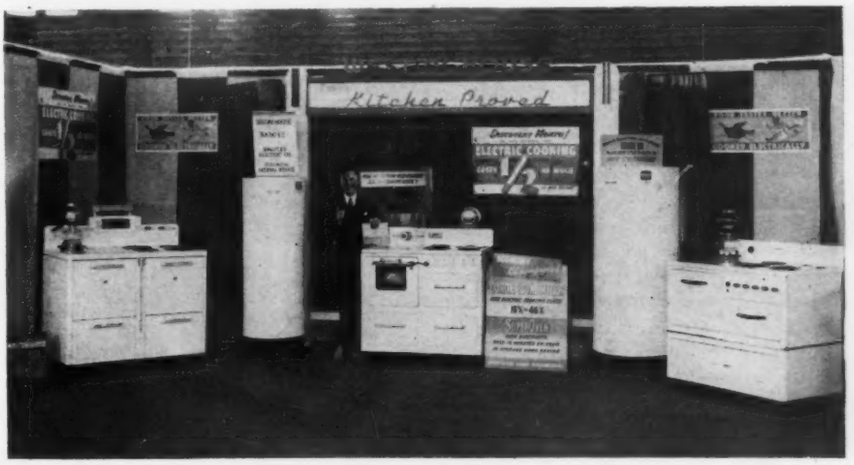
•

Electric Range Test Prizes Are Awarded

Visitors to the recent Marion, Ind., Food and Appliance Exhibit were asked by the Indiana General Service Co.: "How much does it cost to cook nine meals for four people by means of an electric range?" Of the 945 people who submitted guesses only two women had the correct answer. Their guess was 7 kw.-hr., or 17.5 cents, at the local rate. They were awarded electric coffee makers. A third prize, an electric clock, went to a woman who guessed 17.8 cents.

The demonstration was part of the company's "Discovery Month" promotion, in which it tied in with the Modern Kitchen Bureau's national program. With a quota of 80 electric ranges, Indiana General Service sold 94, and it exceeded its electric water heater quota of 20 by selling 29.

The nine meals were actually prepared in the company's booth at the exhibit. Current used was metered and the meter was sealed by the Mayor of Marion before the demonstration. Cards were distributed asking visitors to record their estimates of the cost of cooking the nine meals.



ELECTRIC COOKING—Display of Indiana General Service Co. at the Food and Appliance Exhibit held at Marion, Ind. Two women guessed 7 kw.-hr., or 17.5 cents, at local rate, for cooking nine meals for four people on the electric range

GIFT CENTER—Commonwealth Edison has turned its Chicago electric shops into attractive holiday electric gift centers. Featuring scores of appliances as appropriate gifts, the public has responded to the helpful suggestions

Chicago Utility Plans New Generating Unit

Further details on the $75,000,000 expenditures by Commonwealth Edison Company over the next two years were given last week by James Simpson, chairman, as stockholders approved a new plan to give the company 100 per cent ownership of its affiliated companies. He said the company spends $25,000,000 each year and additional expenditures of $25,000,000 will bring the total to $75,000,000 for the next two years.

Stockholders voted to offer four shares of Commonwealth Edison for each outsanding share of preferred of Western United Gas & Electric. This is in lieu of a former offer to exchange 3½ shares of Commonwealth Edison for one of Western United. All stock which has been exchanged will get the additional one-half share.

Mr. Simpson said that the system now had 1,993,000 kw. of capacity. The peak during the past twelve months was 1,420,000 kw. However, Mr. Simpson said, the company agreed to install additional generating capacity as a result of the National Defense Power Committee conferences.

It has been decided to proceed with engineering studies with respect to an additional 90,000 kw. at the Northwest station and also to modernize 55,000 kw. of capacity, Mr. Simpson declared.

He said that this would be accomplished by installing a 50,000-kw. high-pressure topping unit and by increasing the present boiler capacity of the station to make available 40,000 kw. which cannot now be used. This installation would cost about $8,000,000 and require about two years to complete.

Mr. Simpson said that the installation of an additional 100,000 kw. of generating capacity is now under consideration by the engineers. The exact location is yet to be determined. If installed, he said, this further capacity, together with additional transmission lines and special switching equipment, may cost up to $17,000,000.

•

National Power & Light to Vote on Sale of Unit

Stockholders of National Power & Light are being asked to sanction the sale of the principal properties of the company's subsidiary, West Tennessee Power & Light, to various municipalities in the territory served.

A special meeting has been called for December 20 at Jersey City for action by the stockholders. P. B. Sawyer, president of National Power & Light, said the amount to be received for the property was 76 per cent of the estimated rate base. He said that the alternative to the sale is destructive competition with federally financed and municipally operated electric distribution systems supplied with power by TVA.

•

Authorizes Utility Sale

The Federal Power Commission has authorized the sale by Kentucky-Tennessee Light & Power Co. of certain of its electric facilities to the TVA.

Storm Publicity Aids Public Understanding

That a silver lining bordered the storm clouds in the midst of the Boston Edison Company's restoration efforts following the September 21 hurricane was the feature of a talk last week before the Financial Advertisers' Association by Thomas H. Carens, vice-pre i-dent of the utility.

Mr. Carens pointed out that ordinarily the public is inclined to be critical when an individual service fails now and then or when some employee is guilty of a hasty or discourteous action. "But after the hurricane," said Mr. Carens, "we learned that the public can be sympathetic and tolerant. Of the thousands of messages which we received from our customers after service had been restored, the complaints could be counted on the fingers of one hand. We had 292,000 customers out of service on the night of the hurricane. It took us fourteen days before they were all back on the line. But instead of criticism that it took us so long, the general feeling among our customers was astonishment that the work of rehabilitation had been accomplished so quickly.

"To a very large extent this condition was brought about by a judicious use of paid advertising, both newspaper and radio," he said. "A generation ago the average utility might have been inclined to minimize the damage, but we thought it the best policy to tell the public the truth of our situation. This policy paid us dividends in the complete understanding by the public of our problem. We discovered, somewhat to our surprise, that our day-by-day advertising had a distinct news value. At a time when the press was full of tragedy and devastation stories, the public was not unaware of the efforts we were making to bring conditions back to normal."

•

Marshall Ford Dam Advances

Work on the first stage of Marshall Ford Dam, on the Colorado River in Texas, is nearly three-quarters completed, John C. Page, Commissioner of Reclamation, has reported to Secretary of the Interior Harold L. Ickes.

•

Closes Successful Campaign

Final report on the "Light Conditioning" campaign recently conducted by the Georgia Power Company shows that sales by all company employees amounted to 41,174 cartons of bulbs and 3,984 I.E.S. lamps, or 111.08 per cent of the combined quota.

Two-Year Plant Expansion Plan of Colorado Utility Is Completed

Public Service Company spends $1,835,000 in additions to Valmont station — Increased demand for electricity in territory necessitated enlargement — Station now ranks as one of important in West

A two-year construction program at a cost of approximately $1,835,000 has been completed at the Valmont plant, principal steam-electric generating plant of the Public Service Company of Colorado. Increased demand for electricity in the territory served by the company necessitated this latest enlargement.

Field work on the project started April 15, 1936, and at the peak of work more than 175 men were employed in addition to the regular operating crews.

Lists new equipment

Work in enlarging the plant included the extension of the turbine room, installation of a 25,000-kw. General Electric turbine and auxiliary equipment, extension of the boiler room and pulverizer house, installation of a B. & W. boiler with a capacity of 225,000 lb. of steam per hour; installation of an Allis-Chalmers condenser, construction of a 325-ft. radial brick stack, 22 ft. in diameter on the inside; installation of a 30,000-kva., 13,000/100,000-volt transformer bank, and the necessary electrical auxiliaries, wiring and switchboards. It was stated that this extensive construction program was completed without a serious accident to a single man.

This extensive work at the Valmont plant is only one phase of the construction program now in progress by the company. Work is progressing on the Alamosa plant which will more than double present capacity. The estimated cost of this work is $250,000 and will increase the plant capacity to 5,750 kw.

The original installation at the Valmont plant was made in 1923, with one generator of 20,000 kw., four boilers with a total capacity of 360,000 lb. of steam per hour and four coal pulverizers with six tons capacity each per hour. In 1925 the second turbine and generator of 25,000 kw. was installed. Because of limited boiler facilities, however, the generating capacity of the plant was increased only to about 35,000 kw. by this addition.

A fourteen-month construction program was started in 1930. This included a building extension and the installation of a boiler with a capacity of 275,000 lb. of steam per hour and a coal pulverizing unit rated at 15 tons of coal an hour. This installation raised the plant capacity to 45,000 kw.

With the completion of the new work the capacity of the station has been increased to 70,000 kw., which places the Valmont plant in a position of top-ranking importance among electric generating plants of its kind in the West.

It was stated that a feature of the new generator is that it is a 3,600-r.p.m. unit, one of the few units of this rating operating at this speed.

The company estimates that more than 100 carloads of materials, cement, steel, bricks, the generator, condenser, boiler and other items, were shipped for the project by rail and about an equal amount by truck.

•

Object to Seminoe Dam

Coal and railroad interests in Wyoming and Colorado are raising objections to the use of hydro-electric power from the Seminoe Dam and are arousing considerable local support. Interior Department officials feel that the work has gone too far on the project to consider its abandonment at this late date. They have signed a contract for the three 20,000-hp. units that are to be installed. A transmission line has been built from the dam to Cheyenne. Provision has been made for branch lines to Greeley, Colo., and to Guernsey, Wyo. Officials expect to be able to deliver power early next summer.

•

Requests High Court to Speed Decision

Pennsylvania Public Utility Commission has asked the United States Supreme Court for an early decision on the constitutionality of the rate-fixing powers of the state public utility law which is being contested by the Edison Light & Power Co. of York.

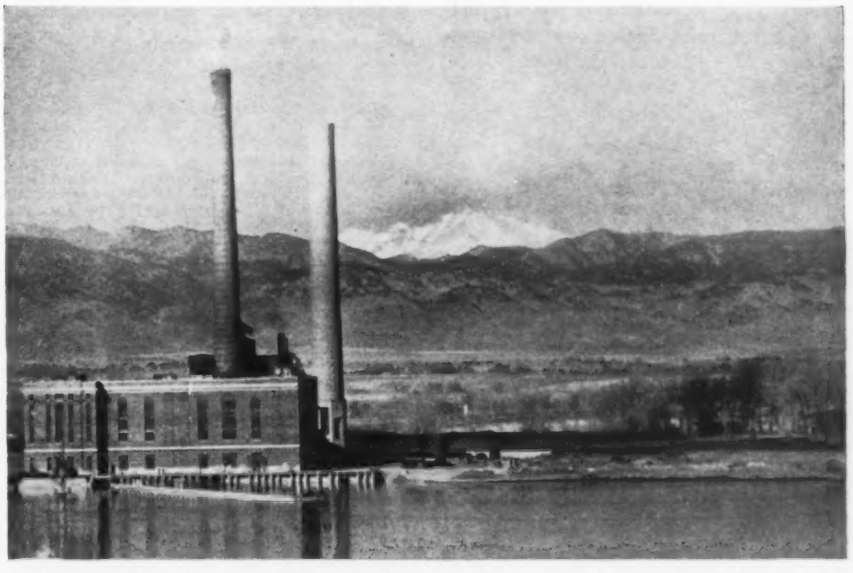
The commission went before the court with a motion asking the court to advance for argument on a date prior to January 16 the commission's appeal from a federal statutory court injunction restraining the commission from enforcing an order requiring the Edison Light & Power Co. to file temporary rates calculated to save its customers $435,000 a year.

The commission states that an early decision is desirable as a guide to it in many other proceedings now pending before it and that the existing conflict of federal district court decisions on the constitutionality of the utility laws makes it impossible for the commission to administer the law effectively.

•

Utility Hearing Postponed

New York Public Service Commission adjourned until December 21 its investigation into the New York State Electric & Gas Corporation's financial dealings with allegedly affiliated service companies.



ENLARGED PLANT—The Valmont plant, principal steam-electric generating plant of Public Service Company of Colorado, has been greatly enlarged as a result of a two-year construction program at a cost of approximately $1,835,000

ASA Discusses New Standards at Meet

William L. Batt, president of SKF Industries and president of the International Management Conference, was guest speaker at the annual meeting of the American Standards Association, held recently in New York. Prior to Mr. Batt's address Dana D. Barnum, retiring president of the association, welcomed the six trade groups that have become members of the association in the past twelve months.

Reporting briefly, F. M. Farmer, vice-president of Electrical Testing Laboratories and chairman of the Standards Council of the American Standards Association, announced that during the year 21 new standards and 24 revisions of existing standards have been approved. Several of these were in the electrical field.

Edmund A. Prentis of Spencer, White & Prentis, New York, was elected president, and R. E. Zimmerman, vice-president U. S. Steel Corporation, was elected vice-president. Mr. Farmer was re-elected chairman of the Standards Council and R. P. Anderson vice-chairman.

•

Metropolitan Life Issues Book on Sales Functions

Metropolitan Life Insurance Company has published a report, "Functions of the Sales Executive," which is of practical use to individuals and companies engaged in the study of continuing management activities and sales functions. Executives of 120 companies supplied the basic data—information concerning the practices and experiences of their own organizations. The report offers a well-founded interpretation of the sales function and the responsibilities of sales executives.

Jerome V. Leary, director of publicity service, Policyholders Service Bureau, New York City, states that copies of the report are available to those desiring it.

•

Appoints Committee Heads

New committee chairmen have recently been appointed to the Public Utilities Section of the National Safety Council as follows: Engineering, W. H. Mulligan, Hydro-Electric Power Commission, Toronto, Ont.; exhibit, E. S. Miner, American Telephone & Telegraph Co.; film strip, A. A. Klinge, Public Service Co. of Colorado; health, Dr. Hart E. Fisher, Chicago Rapid Transit Co.; membership, D. C. Duncan, Appalachian Electric Power Co.; news letter, William L. Cone, Utah Power & Light Co.; poster and safety kinks, H. W. Lueck, Commonwealth Edison Co.; program, P. L. G. Hasskarl, Pennsylvania Power & Light Co.; publicity, J. M. Orts, Public Service Corp., Newark, N. J.; statistics and contest, J. C. Martin, Bureau of Safety, Chicago.

•

Sales Conference Held by Northwestern Electric

Northwestern Electric recently held a sales conference for its employees and associated dealers, jobbers and contractors of the Portland, Ore., area. Sales representatives of Pacific Power & Light took part in the discussions.

Six sales consultants of the commercial department of Ebasco Services, Inc., New York, R. H. Fite, Jr., G. W. Hart, K. M. Montgomery, R. F. Pabst, P. D. Brooks and R. V. Bauer, discussed a variety of subjects.

•

Court Rules for Duke Power

Judge Frank K. Myers of Charleston has filed an order in the United States District Court in Greenville, S. C., dismissing the demand of Greenwood County for $850,000 from Duke Power as the profit it would have made had the power company not delayed the construction of the Buzzard's Roost power project for more than three years.

Meetings

American Association for the Advancement of Science—Winter meeting, Richmond, Va., December 27–31.

American Engineering Council—Annual meeting, Hotel Mayflower, Washington, D. C., January 12–14. Frederick M. Feiker, executive secretary, 744 Jackson Place, Washington, D. C.

Canadian Electrical Association—Mid-Winter Conference, Windsor Hotel, Montreal, January 16–17. B. C. Fairchild, secretary, 804 Tramways Bldg., Montreal, Que.

American Institute of Electrical Engineers—Winter convention, New York, N. Y., January 22–27. H. H. Henline, national secretary, 33 West 39th Street, New York, N. Y.

American Society of Heating and Ventilating Engineers—Annual meeting, Pittsburgh, Pa., January 23–26. A. V. Hutchinson, secretary, 51 Madison Avenue, New York, N. Y.

National Electrical Manufacturers Association—Mid-Winter Conference, Waldorf Astoria Hotel, New York, February 5–11. W. J. Donald, managing director, 155 East 44th St., New York, N. Y.

Louisiana Engineering Society—Annual meeting St. Charles Hotel, New Orleans, La., February 23–25. A. M. Hill, secretary-treasurer, St. Charles Hotel.

Public Power Bodies Talk Tax Limitation

Public power officials from Oregon and Washington, meeting last week in Centralia, Wash., at the request of Bonneville Administrator John D. Ross, agreed that wholesale contracts should contain a maximum tax figure for public power districts.

Without advocating or opposing any specific tax, Mr. Ross declared, "power can stand on its own feet and pay a fair tax, but a heavy and abnormal tax will wipe out the benefits of cheap electricity from the Bonneville lines." He pointed out that the present system of taxing power properties was inequitable; assessments vary from county to county, he said, and most of the taxes, paid by all of the consumers, go to small areas where power plants are located. He suggested a gross revenue tax might be a fairer basis.

Tax questionnaires were to be sent out by Administrator Ross this week to the 28 power districts in Washington, the four in Oregon and to the municipal power systems. Commissioners from the two states will meet in Vancouver, Wash., on December 17 to study further the question of taxation of public power districts.

Previously, Mr. Ross reported reallocation of about $1,250,000 scheduled for transmission lines and substations because voters in seven Washington and one Oregon counties rejected measures to set up public utility districts at the recent general election. The funds intended for those counties will be diverted to extend 110-kv. lines into those counties which did vote for the districts.

Under the reallocation plan a projected $400,000 line to The Dalles will be held up, although Mr. Ross said the line would be carried as far as Hood River, where the city is ready to sign a contract. The Bonneville-Grand Coulee line is to be built as planned, but an $800,000 substation planned in Yakima County will not be built.

•

Urges Table Rock Development

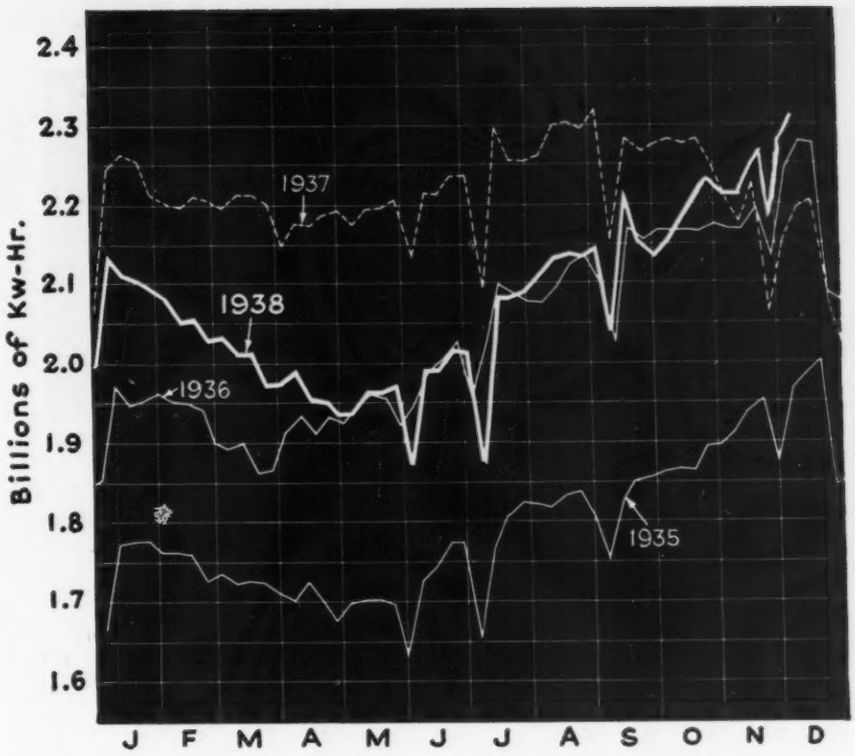
Immediate construction of the $15,000,000 Table Rock Dam and reservoir near Branson, Mo., has been urged by Governor Stark to aid possible development of "a large heavy chemical industry" in the area. The big White River power and flood control project would employ 3,000 men a month during the three years estimated to be needed for its construction. Governor Stark wrote to Harry Woodring, Secretary of War, asking for prompt consideration of the White River project.

Output Close to All-Time Record

Continuing the steady upward movement that has been in progress since last May, with a climb of 33,000,000 kw.-hr. over the preceding week to 2,318,550,000 kw.-hr. in the week ended December 10, the output of the electric light and power industry was a record-breaker in several respects.

As reported by the Edison Electric Institute, it was the highest thus far in 1938; it was the highest in December of any year; it virtually matched the all-time record for any week—in September, 1937—which it missed by only one-tenth of 1 per cent. It was 5.6 per cent greater than in the like week a year ago, compared with 5.7 and 6.2 per cent in the two preceding weeks.

Every section of the country shows operations on a higher level than a year ago. The most striking increase, 16.1 per cent, occurred in New England, which was under 1937 as recently as two months ago. In the Central Industrial area three weeks have brought a change from —0.1 to +6.1 per cent.



Per Cent Change from Previous Year

	Week Ending		
	Dec. 10	Dec 3	Nov. 26
New England	+16.1	+12.2	+12.4
Middle Atlantic	+ 5.7	+ 6.1	+ 5.8
Central Industrial	+ 6.1	+ 5.3	+ 4.6
West Central	+ 1.3	+ 0.0	− 1.0
Southern States	+ 2.8	+ 6.5	+ 6.6
Rocky Mountain	+ 0.5	+ 3.1	+ 4.6
Pacific	+ 4.9	+ 7.2	+ 6.2
United States	+ 5.6	+ 6.2	+ 5.7

Weekly Output, Millions Kw.-Hr.

1938	1937	1936
Dec. 10 2,319	Dec. 11 2,196	Dec. 5 2,244
Dec. 3 2,286	Dec. 4 2,153	Nov. 28 2,134
Nov. 26 2,184	Nov. 27 2,065	Nov. 21 2,196
Nov. 19 2,270	Nov. 20 2,224	Nov. 14 2,170
Nov. 12 2,209	Nov. 13 2,177	Nov. 7 2,169
Nov. 5 2,207	Nov. 6 2,202	Oct. 31 2,176

Los Angeles Commission to Use Competitive Bids

The Los Angeles Water and Power Commission has adopted a resolution instructing the general manager of the Bureau of Power and Light to prepare plans and specifications and call for competitive bids for construction of the 260-mile, 275,000-volt power transmission line which is to be built from Boulder Dam to Los Angeles at a cost of $12,500,000.

F. J. Connolly, manager of the Associated General Contractors of America, stated that the action was taken in accordance with his organization's recommendations. The action of the Los Angeles agency represents a change of policy.

•

New Franchises Granted

New York State Electric & Gas Corporation has been authorized by the Public Service Commission to exercise new franchises for the furnishing of electricity in the village and town of Naples, Ontario County. The company is now serving electricity in the village and town of Naples under a franchise granted in 1912 to the Wayne Power Company, a predecessor corporation. The franchise has a duration of 50 years. It became the property of the present company by transfers and mergers. The new franchises granted by the village board and the town board are what are known as the standard form of franchise used by the company and its affiliates and contain no limitation as to duration.

•

Will Ask Tax Retention

The New York State Conference of Mayors will ask that the present 3 per cent emergency tax on the gross incomes of public utilities be continued another year, unless some other levy can be devised to aid the relief needs of municipalities, William P. Capes, executive secretary of the conference, has announced.

•

Veteran Employees Honored

Two hundred and fourteen men with 20 years' service, the largest number ever admitted at one time, were welcomed into the Veterans' Association of the Wisconsin Electric Power Co., Milwaukee Electric Railway & Transport Co. and associated utilities at the annual meeting in the Public Service Building, Milwaukee, on December 10. James F. Fogarty, president of the North American Co., presented medals to sixteen employees who have been associated with the Milwaukee utility for 40 years.

•

Orders Electric Rate Probe

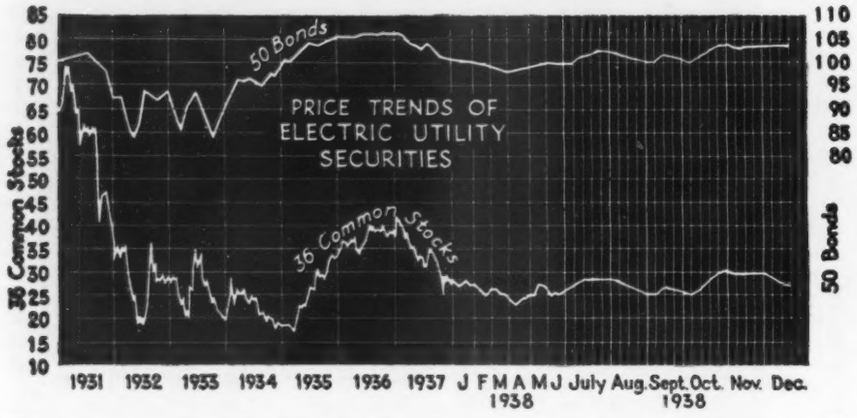
On its initiative, the New Jersey Board of Public Utility Commissioners has ordered a hearing to determine whether electric rates of the Jersey Central Power & Light Co. are reasonable. The commission will begin the hearings on January 12.

•

Erecting Line Extensions

Lines and poles extending electric power into rural sections of north Volusia County are being erected by the Florida Public Service Company. Residents called a halt on plans for a federal rural electrification project when the utility agreed to extend its own lines. At present the poles and lines are being placed in the Barberville section, while surveys are being made for their locations in the other communities.

Utility Stocks and Bonds Off in Week


50 Bonds
PRICE TRENDS OF
ELECTRIC UTILITY
SECURITIES
36 Common Stocks
36 Common Stocks
50 Bonds
1931 1932 1933 1934 1935 1936 1937 J F M A M J July Aug. Sept. Oct. Nov. Dec.
1938 1938

Despite gains on Tuesday last, electric utility stocks were lower for the week, with the "Electrical World" index off 0.1 point to 28.2; index a year ago, 27.4. For the second consecutive week bonds also dipped, with the index 0.3 point lower to 102.9

Utilities Put Large Issues on Market

Offering has been made of $38,000,000 Central Illinois Public Service Company first mortgage bonds, series A, 3¾ per cent, due December 1, 1968, and $10,000,000 serial debentures, 3½ to 4 per cent, due December 1, 1939-48. The bonds were offered at 100½ and interest and the debentures at prices to yield 1.50 per cent for the earliest maturity to 4 per cent for the last. Proceeds from the sale of these issues, together with other funds of the company in the amount of $2,378,262, will be used for the retirement of all outstanding bonds, bearing 5 per cent and 4½ per cent coupons.

Another refunding operation of a subsidiary of New England Power Association took place this week with the public offering of $7,750,000 first and refunding mortgage bonds, 3¾ per cent, series due 1963, and $1,375,000 of 4¼ per cent serial notes, due 1940 to 1953, of Green Mountain Power Corporation. The utility will use the net proceeds from the sale of the bonds and notes to redeem on or before February 1, 1939, first mortgage 5s due 1948, to the amount of $8,250,000, and for the payment of a $450,000 bank loan. The balance will reimburse the treasury for expenditures recently made on improvements to the company's property.

An offering was recently made of $15,250,000 electric plant revenue bonds of the Department of Water and Power of the City of Los Angeles. Of the total, $12,250,000 of the bonds are designated as the first issue of 1938 with a coupon of 3¾ per cent for $8,740,000, due 1939 to 1972, and 3½ per cent for $3,510,000 due 1973 to 1978. Designated as the second issue of 1938 are $3,000,000 of the bonds, with a coupon of 2¼ per cent named for $1,750,000, due 1939 to 1945, and 3 per cent for $1,250,000, due 1946 to 1950. Proceeds from the sale of the first issue, together with remaining proceeds of previous financing, will be used for providing additional capacity through the building of a third transmission circuit and for additions, betterments and replacements to properties. Proceeds from the sale of the second issue will be used primarily for construction work on the distribution system.

•

Suit Answer Filed by Associated Gas

Associated Gas & Electric Co. has moved for dismissal by the Federal District Court for Southern New York of a petition that the company be placed in receivership. The suit which Associated asked the court to dismiss was filed by three of the company's security holders November 15.

Associated's answer to the security holders' suit declared that the charges that the company was insolvent were unsupported by fact, alleged that the petition had not been filed in good faith, and contended that the matter was not within the court's jurisdiction. The answer stated that Associated was not in default in payment of any interest on its indebtedness and that no default on its debt was imminent or anticipated.

•

Offer North American Block

Offering of 375,000 shares of the North American Company common stock has been made by a group of underwriters. The shares were priced at $21.25 each. The shares were sold to the underwriters by American Cities Power & Light Corporation, which will use the proceeds for reinvestment in securities or for other corporate purposes. The North American Company does not own any of the shares offered by the prospectus and will not receive any proceeds from the sale.

•

Files Registration Statements with SEC

Applications and statements have been filled by utility companies with the SEC as follows:

Lexington Water Power Company has filed an application for exemption from the requirment of filing a declaration in connection with the issuance of $3,000,000 of 5 per cent serial debentures due 1939-1950 to Southeastern Investing Corporation in exchange for a like principal amount of the company's presently outstanding 5½ per cent convertible sinking fund debentures, due January 1, 1953. The company is a subsidiary of Southeastern Electric & Gas Company, a registered holding company. The company also filed an application for approval of the acquisition of the 5½ per cent debentures which are to be received in exchange for the new debentures and which will be cancelled.

Declaration field by the Public Service Company of New Hampshire regarding sale of 8,737 shares of $5 preferred stock has been declared effective by the SEC. The shares of stock are to be initially offered to the public at $91 each.

Public hearing on the application of New York State Electric & Gas Corporation will be held on December 19 instead of December 12, as previously announced by the commission.

Community Public Service Company, Fort Worth, Tex., has filed a registration statement with the commission covering 38,821 shares of $25 par common stock.

•

Will Redeem Debentures

Delaware Electric Power Company will redeem on December 31 at par and accrued interest plus a premium of 2 per cent, $240,000 principal amount of its gold debentures, 5½ series, due 1959.

Utility Reports (Earnings)

	Net Income 1938	1937
*Philadelphia Co. and subs.	$6,382,226	$9,013,326
*Virginia Elec. & Pwr.	2,275,896	2,235,600
*Gulf States Utilities	1,455,434	1,143,541
*Arkansas Pwr. & Lt.	1,241,730	1,491,286
*Minnesota Pwr. & Lt.	1,059,818	1,471,859
*Idaho Power	1,773,087	1,353,586
*Montana Pwr. and subs.	2,521,541	3,736,071
*Carolina Pwr. & Lt.	2,481,170	2,632,154
*Texas Elec. Service	1,165,523	1,383,782
*Memphis Pwr. & Lt.	1,953,099	1,597,738
*New Orleans Pub. Serv.	1,321,398	1,064,260
*Utah Pwr. & Lt. and subs.	1,336,887	1,713,666

*Twelve months ended October 31.

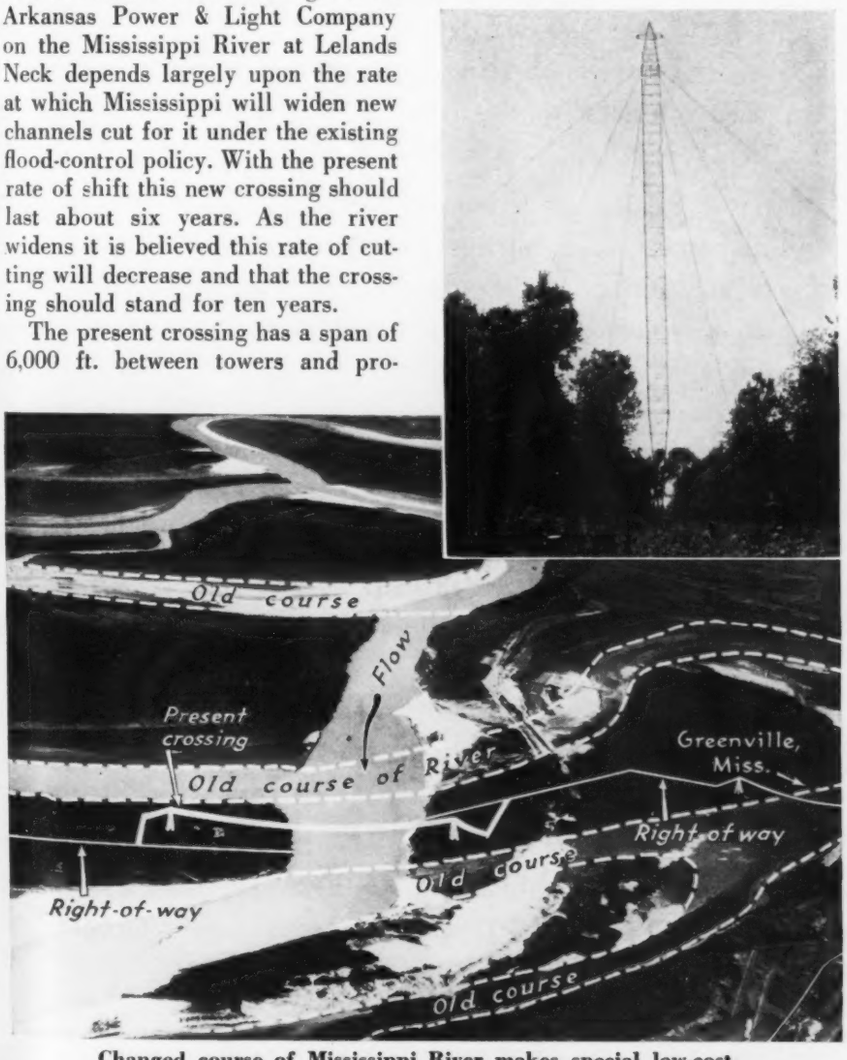
Field OPERATING PRACTICES

New ideas and practices in the operation of well-designed, constructed and maintained plants and systems

Erosion to Determine River Crossing Life

The life expectancy and structural nature of the fourth and newest 110-kv. transmission crossing of the Arkansas Power & Light Company on the Mississippi River at Lelands Neck depends largely upon the rate at which Mississippi will widen new channels cut for it under the existing flood-control policy. With the present rate of shift this new crossing should last about six years. As the river widens it is believed this rate of cutting will decrease and that the crossing should stand for ten years.

The present crossing has a span of 6,000 ft. between towers and provides a clearance of about 75 ft. above maximum high water. Towers are 560 ft. high and are guyed laterally, with one guy on each side of each tower. The three conductors attached to anchors 1,500 ft. back of the towers act as guys to prevent the towers from falling toward the river, while the span conductors act as guys to prevent their falling from the river. Both towers are leaned slightly toward the river to increase the effectiveness of span wires as guys.



Changed course of Mississippi River makes special low-cost, short-life transmission crossing necessary

Aerial view of Leland Neck crossing shows location of river when line was first built, right-of-way for the line and location of present 6,000-ft. crossing that involves use of 560-ft. masts, one of which is shown.

For many years it was the policy of flood-control engineers to maintain the river in its existing bed as far as was practical. This tended to maintain bends which held back floodwaters instead of letting them pass quickly. During this period the Arkansas Power & Light Company built a 110-kv. line from Arkansas to Mississippi which traversed the length of one of the necks thus formed. Five years after this line was built the old policy of river control was changed to one of cutting the necks and straightening the river as shown in the illustration. Such a cut was made in this neck some six years ago, which the river immediately began to widen rapidly.

Since the transmission line traversing the neck was an important link in the interconnected system a temporary crossing of native poles was immediately erected to await river developments. The tower on the right bank was 100 ft. from the bank and the other tower 400 ft. This crossing stood for about a year, when parts of both structures fell into the river the same week.

By this time some 40 per cent of the low water flow of the river was going through the cut and the rate of widening, though still rapid, was decreased. Utility company engineers studying the situation finally decided that a cheap crossing could be built to last five years at a cost less than moving to a new location. Consequently a guyed mast crossing 3,500

The G-E SPIRAKORE

cores wound

For Better Performance—
Lower Prices, Too

YOU asked us to build you a lower-priced distribution transformer that would be just as good as those we have been supplying you.

The G-E SPIRAKORE transformer accomplishes all this through a revolutionary development which permits us to wind cores with great rapidity from a ribbon of continuous cold-rolled steel strip possessing superior magnetic characteristics.

It has higher efficiency at heavy load; it has lower exciting current and better voltage regulation; it is easier to handle because of its lighter weight; AND it is more economical to manufacture.

It is always possible to lower prices by such temporary expedients as the use of lower-quality materials or less careful methods of manufacture. The SPIRAKORE development utilizes not only new and better materials, but an even more precise and effective method of manufacture. It is a fundamental and permanent step forward that inevitably will have a far-reaching influence in the transformer field.

If you are already familiar with this development, you probably realize that it represents the greatest measurable benefit in recent years in the field of distribution. You have undoubtedly sensed, too, that it is only the beginning—that much more can be expected from the application of G-E research and engineering to this promising new discovery.

G-E SPIRAKORE transformers, which can be identified by the red spiral on the tank, are available in single-phase, 60-cycle ratings, 1½ and 3 kva, 7620 volts and below, and 2½ kva, 11,500 and 13,200 volts. Other ratings can be expected as rapidly as good engineering and thorough testing will permit.

Ask your General Electric representative for further details, and begin now to specify SPIRAKORE transformers. General Electric, Schenectady, New York.

GENERAL ELECTRIC

TRANSFORMER

in a spiral

G-E SPIRAKORE TRANSFORMERS CAN BE IDENTIFIED BY THE RED SPIRAL ON THE TANKS

CORE-AND-COIL ASSEMBLY FOR
NEW SPIRAKORE TRANSFORMER

ft. long with towers 270 ft. high was designed and erected. It was located upstream from the original crossing on the right or west bank and downstream on the left bank, this being presumed to be the most permanent location. The right tower was 1,300 ft. from the bank, the left 400 ft. This crossing was used for almost four years, when it was wrecked to prevent its falling into the river.

The entire flow was now passing through the cut and the old channel had been blocked by a dike. The left bank has apparently became stable, but cutting on the right banks is still quite active. In locating the present crossing the east tower was set as close to the river as possible and still have it protected from driftwood. The west tower is located as far from the river as the length of the span will permit.

•

Open Cable Support Offers Advantages

Generator leads of the 50,000-kw. superposed unit at Springdale station of the West Penn Power Company, running from the unit itself to the 11-kw. switch house, are supported in the manner shown on a box-like

Support leads from Springdale unit in ceiling mounted structure

structural steel frame surrounded by a perforated aluminum protective cover. The frame is 20x58 in. in sectional dimension and supports four 2,000,000-circ.mil cables per phase on Transite blocks. Bottom members of the box structure are removable to facilitate cable installation and removal. In addition to the moderate cost of this arrangement it also affords excellent ventilation of the cable and is easy to support. The use of perforated aluminum is said to minimize rattling of the cover due to stray currents.

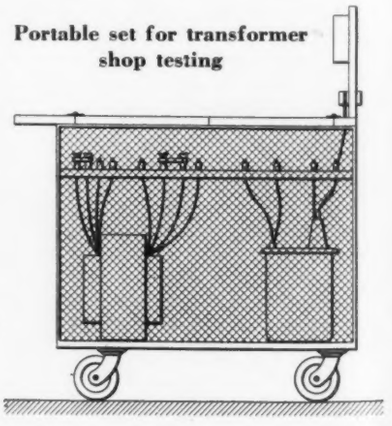
•

Safer and Simpler Transformer Testing

Long leads in a snakelike tangle on the floor and festooned through the air like vines in a tropical jungle no longer grace the transformer testing room of the Oklahoma Gas & Electric Company where repaired transformers are checked before being marked ready for service. The testing room used to be all cluttered up with leads when the facilities for test energy supply and control were fixed in one place and connections had to be made with cables from a stationary panel. Most of the testing is of small and medium-sized transformers and one bright day the idea was born that for this kind of work the room could be considerably cleaned up if the test energy supply and control were brought right up close to the transformer under check. Connections would then be direct and short, and the work made less cluttered and safer.

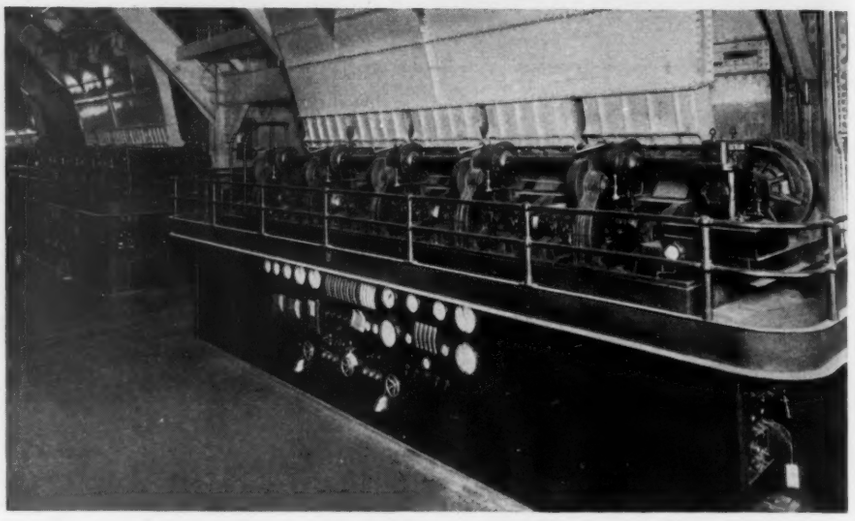
The portable testing set indicated in the accompanying sketch was built. It consists of a screen-inclosed cart in which are carried a 50-kva. transformer core and a potential transformer. Above these units is a horizontal panel in which are set the terminal studs. By various link connections on the studs the low voltage side of the 50-kva. core can be set for 110, 220 or 440 volts and the high voltage for 3.3, 6.6 or 13.2 kv. The potential transformer leads are also studded in the panel for such connection as may be desired. The top of the cart is divided into two flaps hinged at the outside edges so that they may be raised for access to the

Portable set for transformer shop testing



connection panel below. At one end of the cart is an upright panel with a voltmeter and receptacles into which the short test leads are plugged. The only trailing leads are those for the low voltage supply to the cart. The 50-kva. core is of ample capacity for most ordinary testing. The flat top of the cart makes a convenient table for instruments used in testing.

MAKE CONTROL PANEL PART OF BOILER FRONT



Panels for boiler instruments and control devices removed from their usual positions in the firing aisle have become part of the boiler fronts in Delray power house No. 3 of the Detroit Edison Company. This arrangement saves space in the aisle and permits a more compact—therefore more economical—design of boiler house.

us better service and lasts longer!" .. SAYS CHIEF ENGINEER

"In its fifth year in service in this turbine, our GULFCREST OIL is still in perfect condition. We use very little make-up oil."

Here is one important reason for the remarkable records of stability Gulfcrest is making in plants from Maine to Texas: *It has been refined and purified by Gulf's exclusive Alchlor Process!* This advanced refining method removes the bulk of the undesirable hydrocarbons and other impurities which cause oxidation and sludge formation. That is why power plant operators find that after years of service Gulfcrest shows far less deterioration than any oil they have ever used.

Operating data covering the performance of Gulfcrest Oil in major turbine installations throughout the country are verifying daily the fact that Gulfcrest is the most outstanding contribution yet made to turbine lubrication.

If you would like to know more about this advanced type of turbine oil, fill in and mail the coupon below. You will not be obligated in any way.

GULF OIL CORPORATION
GULF REFINING COMPANY
GENERAL OFFICES: GULF BLDG., PITTSBURGH, PA.

GULF INDUSTRIAL LUBRICATION

WRITE FOR THIS PAMPHLET ON GULFCREST OIL....

GULF OIL CORPORATION—GULF REFINING COMPANY
Gulf Bldg., Pittsburgh, Pa. E.W.

Please send me a copy of your pamphlet which discusses Gulfcrest Oil for turbine lubrication, entitled "For Civilization's Mightiest Machines."

Name.....

Company.....

Address.....

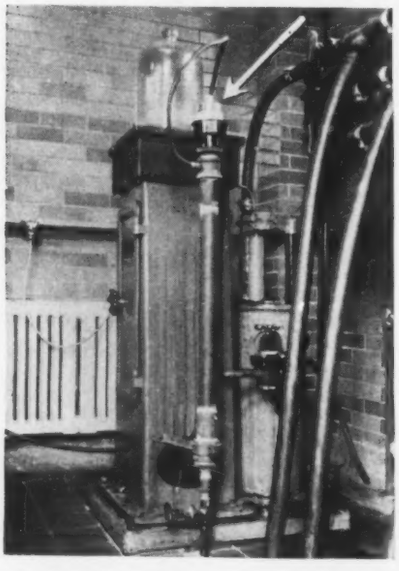
Industrial ELECTRIFICATION

New ideas and practices in industrial electrification as presented by industrial, consulting and power sales engineers

Stops Freeze-Up of Chlorination Jet

By R. F. SCHARF
Sales Engineer
Consumers Power Company,
Muskegon, Mich.

A few months after the new Muskegon, Mich., water filtration plant went into operation difficulty was experienced with the chlorination process. When the lake water temperature went to 42 deg. F. or below freezing resulted at the nozzle of the chlorination jet. This freezing was apparently caused by expansion of the chlorine (usually supplied in cylinders under a pressure of 90 lb. per sq.in. at a temperature of 65 deg. F.) as it was mixed with an auxiliary water supply later to be added to the mains.



Immersion unit keeps chlorination equipment from freezing in water filtration plant

Since the temperature of Lake Michigan water remains below 42 deg. F. about five months of the year, some measure was necessary in order to insure proper operation of the chlorination jet during this period.

The problem was called to the attention of the local utility company by Superintendent Lee Sensabaugh. It was found that only 20 gal. of auxiliary water was required per hour and that this could be kept from freezing at all times by a 3-kw. immersion heater with a three-heat switch. The heat exchange unit, which was fashioned from copper tubing and standard pipe fittings, is shown in the accompanying illustration. Due to its small diameter the unit provides rapid exchange of heat. The unit, normally operated at medium heat, is giving unfailing satisfaction.

Flash Welder Power Effectively Supplied

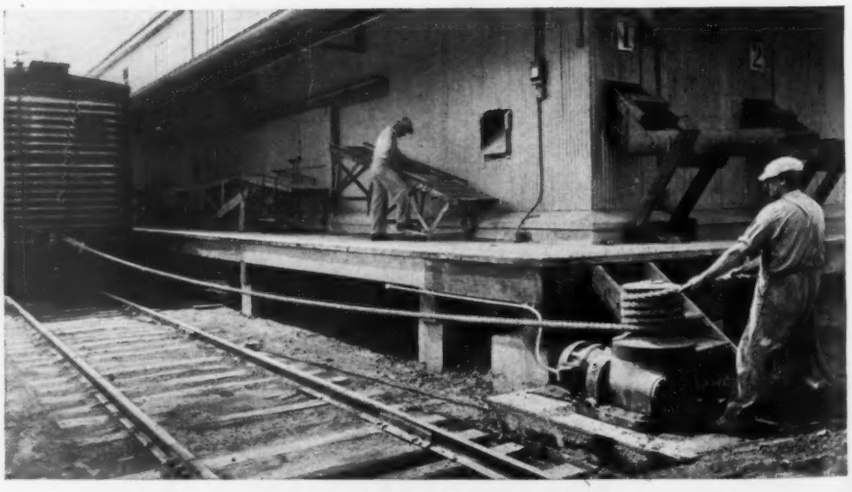
By E. L. BAILEY and V. KNECHT*
Chrysler Corporation, Detroit, Mich.

Nature of the power supply to two Metropolitan resistance welders "flash" welding the two halves of rear axle housings at the Chrysler Corporation plant at Detroit has largely been dictated by the need for increasing production without sacrificing electrical efficiency and without subjecting the system to too great shock.

Magnitude of the problem is demonstrated by the fact that 1,000 kva. is involved in making a 100-in. weld and that an axle housing is

* From a paper presented by the authors before the American Welding Society, Detroit, Mich., October 16 to 21, 1938.

ELECTRIC POWERED CAR SPOTTER



In a plant like the Canada Packers Limited, Toronto, where a considerable amount of shifting of railway cars must be done, it isn't always possible to wait for a switching engine. To reduce handling costs and speed up movement of material the illustrated Link-Belt car spotter was installed. It is powered with a 10-hp., three-phase, 25-cycle, 550-volt motor. Haulage rope speed is 38.7 ft. per minute.

Insure LONG TROUBLE-FREE *performance* AT MODERATE COST

3 SIZES

TYPE 660—FOR VOLTAGES UP TO 8,000
TYPE 670—FOR VOLTAGES UP TO 10,000
TYPE 680—FOR VOLTAGES UP TO 15,000

Handle most PRIMARY line requirements

● Series 600 represents entirely new insulator design in Hemingray Glass—an all-around better insulator for use on distribution primaries. With great mechanical strength, they render long, efficient service under either light or heavy loading conditions. The greater leakage distance assures outage-free performance. The brass bushing provides increased mechanical strength to the insulator in service.

● Specify series 600 for lower initial and overall costs. Send for samples now. Owens-Illinois Glass Company, Hemingray Div., Muncie, Ind.

HEMINGRAY INSULATORS

OWENS-ILLINOIS GLASS COMPANY

"First in Glass"

completed every 13½ seconds. The first welder that was used for this operation, purchased about ten years ago, was designed for 440 volts, 5,000 amp. and was supplied from a synchronous-motor-driven single-phase generator rated 440 volts, 3,500 amp., 60 per cent power factor. This equipment operated for some years on limited production, starting at about 40 axles per hour, and a yearly production of less than 100,000 axles. As greater output became necessary and this welder began to show overload a new one was purchased in 1933 and the schedule moved up. Then the 1,470-hp. motor-generator set was in trouble.

In order to meet this condition a new, larger 2,500-hp. flywheel type induction motor drive set was installed late in 1934, together with switching equipment, that would allow first one welder and then the other to be connected to the generator so that one set could serve both welders. This arrangement permitted production of 135 axles an hour on each welder, a total of 270 per hour and a yearly production of 1,000,000 axles.

Power factor low

With this arrangement the combined effect of welders and large motors operating at light load a fair portion of the time in this department resulted in low power factor. This condition had to be improved to get the best power rate.

This problem was solved when it was found that the actual voltage required on the welder circuit was 270 volts and not 440 and, further, that the power factor of the welder circuit was about 60 per cent. By installing a 440/270-volt auto-transformer and 440-volt static condensers it was found that the old synchronous-motor-driven generator could be made to supply the correct kva. to the welders without overload. Consequently the old generator is now operating at normal full load, 85 per cent power factor at normal voltage and supplying the welders.

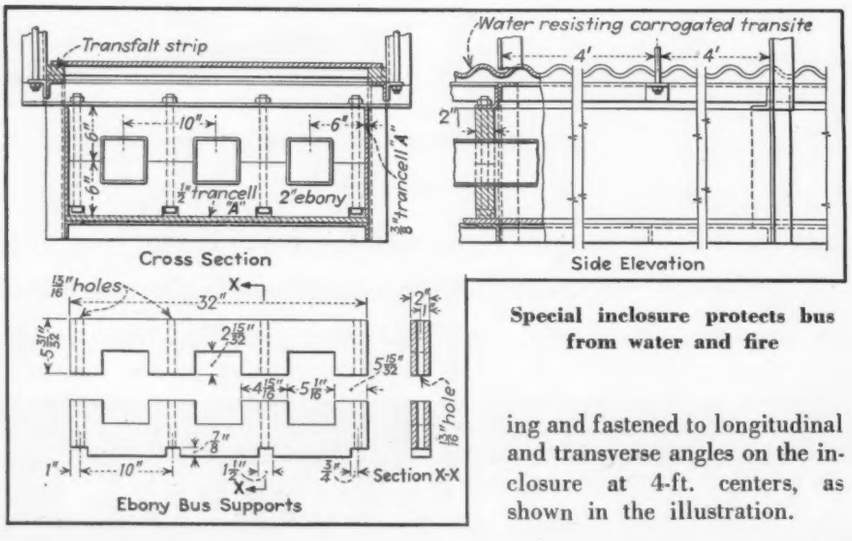
•

Inclosure Guards Bus Against Water Leaks

Ceiling-mounted power buses at the Three Rivers plant of the Eddy Paper Corporation are completely inclosed in a specially designed supporting inclosure as a protection against possible water seepage from the floor above. The plant in which the inclosure is used manufactures paper containers, a process in which considerable water is used. Though seepage is not common in this plant protection against the possibility was considered expedient. The inclosure also provides protection against fire, a potential enemy in any paper plant.

Buses are square in section and are supported on notched ebony spacers which are bolted around them. The inclosing "box" uses ⅜-in. Trancell A sides and a ½-in. Trancell A floor. Water- and acid-resisting bituminous impregnated transite is used on the top where water seepage from the floor above would reach the inclosure.

Support for the inclosure is provided by bolts embedded in the ceiling and fastened to longitudinal and transverse angles on the inclosure at 4-ft. centers, as shown in the illustration.

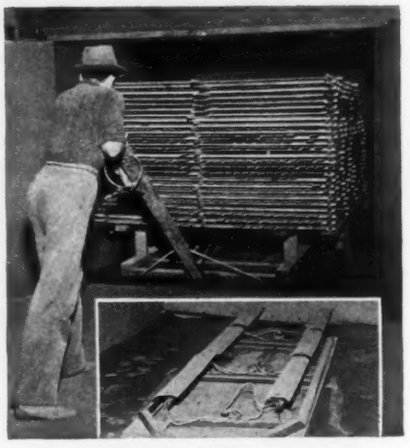


Special inclosure protects bus from water and fire

Six-Kilowatt Oven Dries Venetian Blinds

By W. B. CHENEY
Industrial Heating Engineer,
Southern California Edison Company,
Los Angeles, Cal.

Even southern California's famous sunshine cannot compete with electricity for reliable drying. A case in point is the new "strip-heated" drying room installed at Clyde R. Alling's Venetian Blind Manufacturing Company, Culver City, Calif., to replace air drying of paint on blinds. The oven has considerably speeded production at little expense for construction and operation.



Six kw. of strip heaters aid dyeing of painted blinds
Venetian blinds wheeled into Celotex-lined room on trucks are swiftly dried in air at 110 to 120 deg. F.

The heating room consists of a frame 8 x 10 x 6 ft. high, constructed of 2 x 3-in. lumber, lined with Celotex. Adjustable vents at the top and bottom permit proper ventilation. Six 1-kw., 230-volt strip heaters are mounted in units of two on racks which rest on the floor and are plugged into floor outlets. A thermostat, located near center of the ceiling, controls the heaters through a magnetic contactor—the energy is three phase. Operating temperature is from 110 to 120 deg. F.

Slats are moved into the room on special racks and are thoroughly dried in a few hours. A charge can be placed in the drying room at quitting time and, thermostatically protected, will dry during the night and be ready for use the following morning.

The blind company reports operation entirely satisfactory.

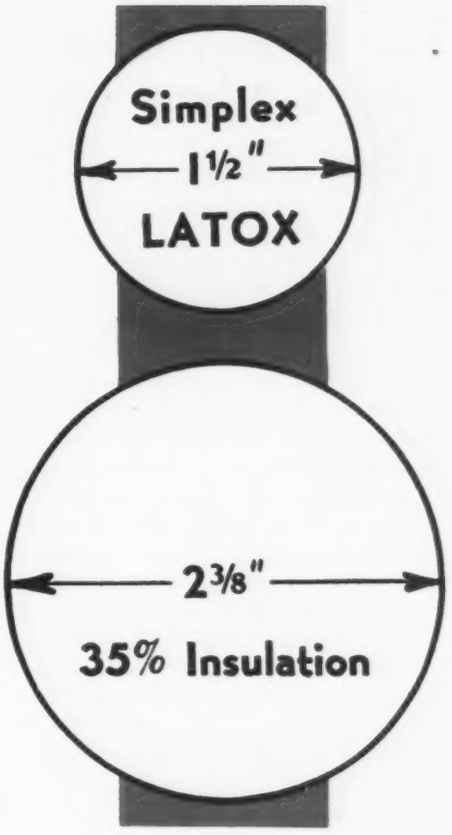
You Can— with Simplex-LATOX Cables

You can put more control circuits in an already crowded conduit. One way — we believe it is the best way — is to replace conventional cables with Simplex-LATOX cables. Many electrical engineers have solved their problem in this way during recent years of stringent economy when faced with the necessity for providing additional circuit facilities.

Simplex-LATOX, the new thin rubber insulation — made directly from rubber latex — enables us to put more conductors into a cable of given diameter without sacrifice of any electrical qualities or insulating properties.

Simplex-LATOX cables are from 30% to 50% smaller than cables insulated with conventional rubber insulation. Each circle above shows the exact size of a 127 conductor lead covered control cable. One is insulated with Simplex-LATOX, the thin insulation made directly from rubber latex, the other has conventional 35% rubber insulation.

A copy of the book "Simplex-LATOX Lead Covered Cables" will be sent upon request.



Simplex Wire & Cable Co., 79 Sidney St., Cambridge, Mass.

Simplex – LATOX

Thin insulation made directly from rubber latex

New ENGINEERING IDEAS

Discoveries, proposals and developments by electrical engineers and scientists in the field, the factory and the laboratory

Phototube Device Sees Mercury Vapor

The physical law that any vapor will absorb the same color of light that it emits when excited has been applied in a new photo-tube device that detects the invisible and poisonous fumes of mercury vapor. Since mercury's emitted light is blue and ultra-violet, light from a lamp giving these colors is passed through samples of the air sucked into the detector unit. If mercury vapor is present it absorbs the light from the lamp and casts a shadow. Too slight for perception by the eye, this shadow is detected by a phototube upon which it is directed. The actual amount of mercury, which bears a relation to the amount of the shadow cast, is measured by the apparatus. An extremely low ratio of mercury to air—as little as one part to one billion parts of air—casts the shadow distinctly.

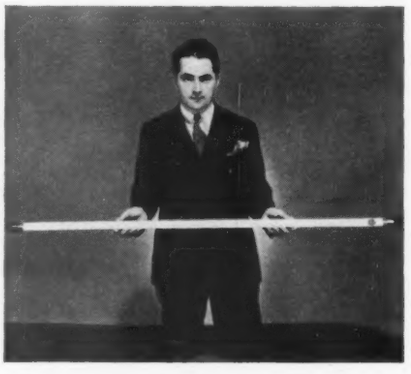
This optical method of detecting mercury vapor, developed in the General Electric Research Laboratories, has the advantage over the chemical method (ELECTRICAL WORLD, November 5, 1938, page 80) that it is almost instantaneous and depends basically on the opacity of mercury vapor to ultra-violet light. In the actual apparatus an ultra-violet lamp and an ultra-violet sensitive phototube are mounted at opposite ends of a short length of 2-in. standard pipe through which the air or gas sample is drawn. Presence of mercury will reduce the amount of ultra-violet light received by the phototube and hence its current emission.

A vacuum tube amplifier is mounted in the same housing as the phototube. An indicating meter measures the decrease in plate current of this amplifier from the condition of a pure gas sample. A current flowing in the meter signifies a reduction of the light and the presence of mercury vapor.

•

Fluorescent Lamp Has Steady D.C. Arc

By using a full-wave rectifier type circuit operating a steady d.c. arc through the tube stroboscopic flicker has been eliminated from a new 4-ft., 100-watt tubular fluorescent lamp developed especially for industrial use in the research laboratories of the General Electric Vapor Lamp Company. Reportedly the largest output fluorescent lamp yet to be put on the market, it has an efficiency of 50 lumens per watt—three times that of an equivalent wattage incandescent lamp. It has a bare lamp rating of 5,000 lumens. Light from the new unit is blue-white in color.



Stroboscopic effect eliminated in new 100-watt fluorescent lamp

Full-wave rectifier operates a d.c. arc through tube of new 4-ft., 100-watt fluorescent lamp for industrial use. Light from unit is blue-white with sufficient red to serve practically all industrial requirements.

The lamp and auxiliary circuit is designed to operate at 90 per cent power factor, a factor which should make possible full use of the lamp's efficiency on distribution systems without additional correction. Fifteen of these lamps may be operated on any branch circuit as there is no overcurrent at the starting time.

Lamps will be designed for operation on 115- or 230-volt, 60-cycle service and will have equal efficiency and similar auxiliary equipment for either service. The 115-volt lamp will be equipped with primary taps centered at 105, 115 and 125 volts, while the 230-volt unit will have line taps centered at 210, 230 and 250 volts. Inasmuch as the secondary circuit of both these lamps is identical, there will be no difference in efficiency or in over-all wattage between 115- and 230-volt service.

The lamp is slightly larger than 1 in. in diameter and 50 in. between cathodes. Concentration of the light output in the lower hemisphere will be achieved by mounting the tube under an efficient trough-type reflector. Mounted in the reflector with standard tube clamps, the tubes will obtain their electrical supply through two- and three-point plugs attached to each end.

The electrical equipment will be contained in a dust-tight compartment. This, coupled with the lamp's low operating temperature, will make the lamp suitable for operation in dusty and lint-laden atmospheres.

To Help You Plan for MORE 1939 Orders!

Questions like these have an important bearing on your business in 1939—

- What additions were made to Power Plant Capacity during the year?
- What additional capacity is planned for '39?
- What was the total Generating Capacity for '38?
- How rapidly is Domestic Consumption rising?
- What is the total Capacity in each state—Steam, Hydro, etc.?
- How much did average Rates Decrease? (Industrial, Residential & Commercial)
- How many New Customers in each state? (by classes)
- What are the prospects for New Substation Capacity?
- How fast is Rural Service being extended?
- What part of Earnings go into Operating Expenses?
- What part of Earnings go into Wages? . . . Taxes?
- How much New Capital was Invested? . . . How much for Refunding?
- How much Money will the Utility Industry spend for New Construction in 1939?

You'll find the answers in facts that will help you plan for 1939 in the 35th Annual Statistical Issue of Electrical World.

JAN. 14th 1939

Advertising Forms Close JAN. 4th

ALWAYS A SELLOUT—RESERVE YOUR COPY NOW!

ELECTRICAL WORLD, 3000 McGraw-Hill Bldg., New York, N. Y.

(If you are already a subscriber to Electrical World, you will automatically receive the January 14th, 1939 Statistical Issue without extra cost. But if you want extra copies, we suggest you make your reservation now. Use the handy coupon!)

- Please reserve ..... copies at $1.00 each, postpaid, of the 35th Annual Statistical Number of Electrical World. Please send my copies and bill to me at the address to the right.
- Please enter my subscription to Electrical World for one year, with the understanding that the January 14th Statistical Number will be included without extra cost to me. Please bill me for 52 issues at $4.00—(annual subscription price U.S.A.)

My name ..... Title.....

Company .....

Address .....

City & State 12-17-38

Building Up THE LOAD

New ideas and practices in selling electrical equipment and service to commercial and domestic customers

Small Store Boasts 6 Kw. of Lighting

By H. E. VOGEL
Lighting Division,
Cincinnati Gas & Electric Company

The Evans & Sullivan clothing store of Lockland, Ohio, has been remodeled to serve as an example of advanced lighting practice to the progressive suburban community in which it is located. The interior of the store presents an appearance of neatness and modernity. The salesroom is finished with a white ceiling and light buff side walls. It is lighted by twelve special indirect light boxes, symmetrically arranged and mounted on the store fixtures.

Each light box contains one 500-watt neck-silvered lamp burning base down, complete with focusing adjustment permitting some control of light distribution. Interior of the light boxes is finished in flat white paint; exteriors conform with the store fixtures.

This system of lighting provides from 18 to 20 ft.-candles throughout the salesroom—the kind of lighting that makes the clothing displayed appear at its best.

•

REA Load-Building Figures Available

A survey was made this spring covering 46 of REA's earlier projects and more than 17,000 of their members, G. D. Munger, director utilization division, REA, told N.E.M.A. at its latest annual meeting. The average length of electric service was less than nine months. The following is the saturation of some of the principal appliances:

Irons	81%
Radios	86%
Ranges	5%
Refrigerators	26%
Vacuum cleaners	16%
Washing machines	47%
Water pumps	17%

REA found that the average farmer within nine months of the time electricity was made available to him had purchased $180 worth of appliances. Based on this average, the addition of 600,000 new customers since the inception of the REA program has resulted in appliance sales of more than $100,000,000. In addition to these farmers who have been receiving electricity for a short time it is estimated that lines now under construction or which will be authorized for construction by the end of the present fiscal year will serve at least 500,000 customers. With these same average figures in mind, REA calculates an immediate demand for at least $90,000,000 worth of appliances.

These figures are based only on nine months of electric service. These appliances were purchased in spite of the lack of sales efforts on the part of dealers and manufacturers. On some projects there were no dealers. On others the dealers were reluctant and in many cases actually refused to canvass the rural lines. It might be said that these appliances were *purchased* by farmers and not *sold* to them.

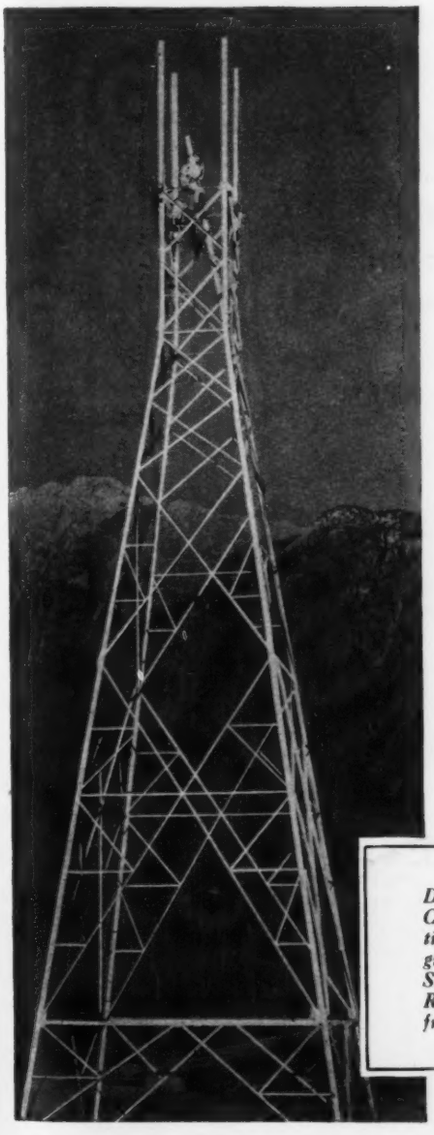
These figures are interpreted by REA to mean that even with the present inadequate appliance distribution system in rural districts 130,000 farmers out of the 500,000 who will soon be connected to REA lines will buy refrigerators within nine

Eighteen to twenty foot-candles provided from twelve 500-watt neck-silvered lamps in this store-lighting job engineered by Cincinnati Gas & Electric

DESIGNED FOR *Dependable Service*

UNDER EXTREMES OF CLIMATE AND TERRAIN

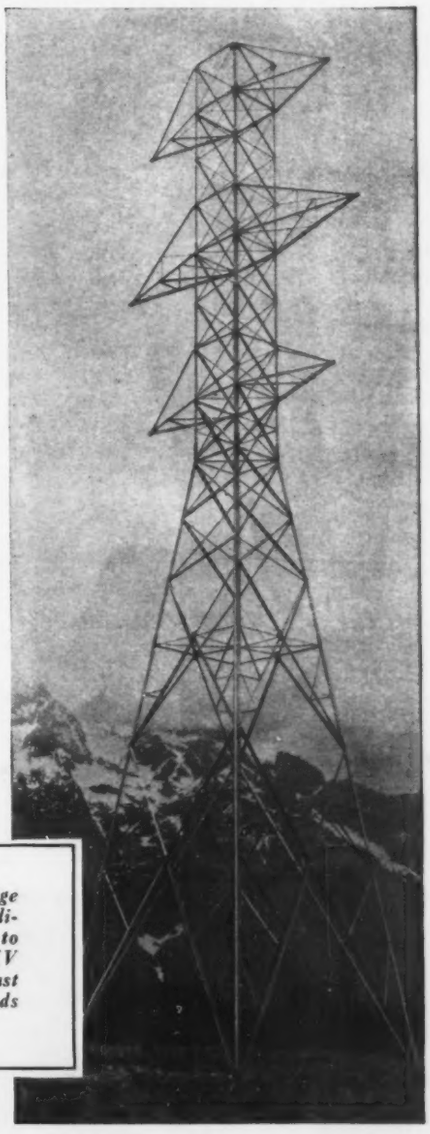
American Bridge Transmission Towers Skirt the Northwest Coast Range



TOWERS of today have to carry high voltages for long distances . . . must provide adequate clearances for the power cables. Their design must give careful consideration to the character and accessibility of the terrain . . . to economical and durable construction . . . to simplicity and speed in erection.

Planning towers to meet any problem of service, terrain and weather—towers to do specific jobs and do them well — has been the aim of American Bridge engineers since 1905. In the intervening years, they not only have kept pace with the ever-growing needs of electric power transmission, but have developed many patented features which contribute to more effective and economical construction of America's power net work.

The entire resources of American Bridge Company, which include an accumulated fund of highly useful experience, ample plant facilities, and up-to-date equipment for full-size tests, are at your service for any tower job.



***DESIGNED** and fabricated by American Bridge Company to fit pre-determined foundation conditions, these suspension type towers stand ready to give yeoman service on the double circuit, 240 KV Skagit Line No. 2. Skirting the Northwest Coast Range, this 116-mile electric power line extends from Newhalem, Wash., to Seattle.*

AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.

Baltimore · Boston · Chicago · Cincinnati · Cleveland · Denver · Detroit
Duluth · Minneapolis · New York · Philadelphia · St. Louis

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

Philadelphia Electric uses this kit to demonstrate the economy of commercial electric cooking. When thermostatic control of appliance cuts in, red target light glows. When control shuts off current, "Dr. Free" sign lights up

months of the time they receive current, 235,000 will buy washing machines, 430,000 radios will be purchased, 85,000 pumps will be installed, 80,000 vacuum cleaners will be sold. This is for new customers only and does not include the huge volume of sales to customers who have received current for more than nine months.

•

"Dr. Free" Convinces Commercial Prospect

By PHILIP M. ALDEN
Manager Retail Sales
Philadelphia Electric Co., Philadelphia, Pa.

Added customer interest in commercial electric cooking has resulted from the use of a commercial electric cooking demonstrator built to help promote the sale of all cooking appliances having thermostatic control. It definitely overcomes one of the sales obstacles in dealing with the customer on demonstrations where you are trying to prove that the equipment, when not in use, maintains the proper temperature at all times, but current is only consumed approximately one-third of the total time. A test on a grill, without food, proved that it was on one minute and off two minutes.

While the equipment is consuming current the red bulls-eye is lighted, but when the thermostat takes the equipment off the line the "Dr. Free" (free cooking) sign is automatically switched on, and at the same time a single-stroke bell rings, giving also an audible signal. Another advantage in using the kit for demonstration purposes is that it adds considerable showmanship to selling. It's the old story that one picture is worth 10,000 words, and since 87 per cent of all reactions pass through the eyes, the customer has no doubt as to the automatic operation of the thermostat.

Since the development of the kit another use has been found for it. In adjusting the thermostat in conjunction with the proper temperature control the kit has been found to be a valuable aid. Here again the thermostat operation can be definitely checked against the thermometer reading.

•

Home Sales Vital to Alabama Power

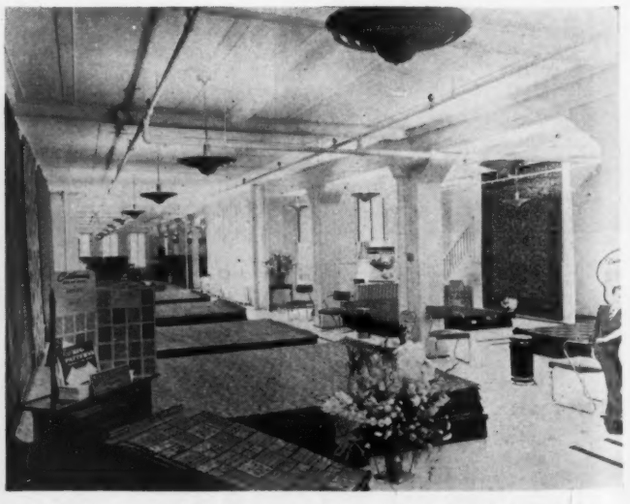
Emphasis placed on appliance sales and on domestic lighting by Alabama Power Company was evident from data supplied to the recent sales meeting of the Southeastern Electric Exchange at Atlanta, Ga., by W. M. Stanley, vice-president in charge of sales.

Of the total employees employed primarily in sales promotion some 65 per cent are engaged in appliance sales, home economics and home lighting, as shown by the following table:

1. Total employees—all departments		2,500
2. Number of employees engaged in sales work:		
(a) Directly		200
(b) Indirectly*		500
Total		700
3. Direct sales employees		200
Grouped: (1) Power sales		7%
(2) New industries		2%
(3) Rural and towns		9%
(4) Sales promotion:		
(a) Appliance sales	45%	
(b) Home economics	10%	
(c) Home lighting	10%	
(d) Comm. lighting	5%	
(e) Dealer co-operation	4%	
(f) Miscellaneous	8%	
Total	100%	

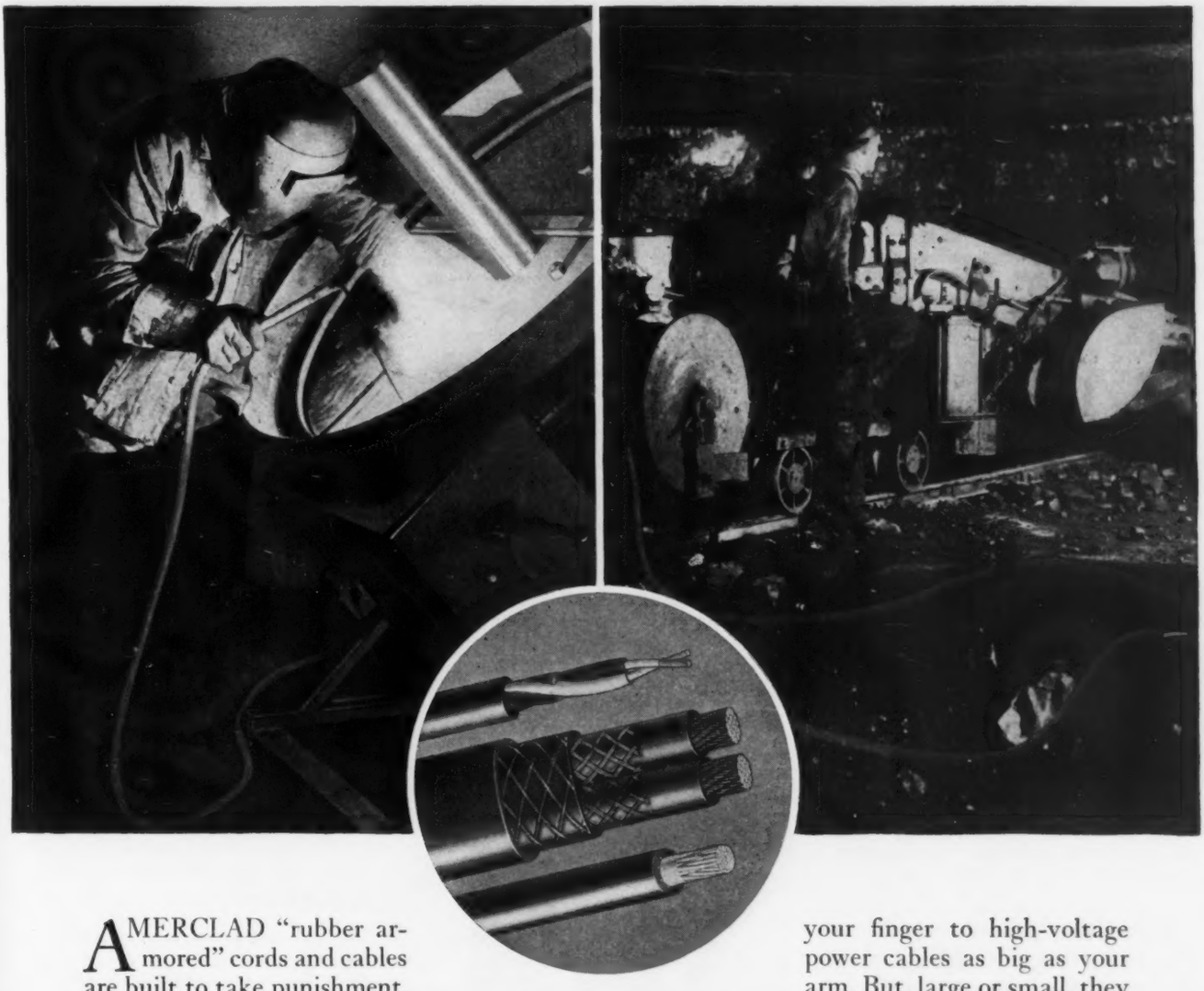
* Employees in other departments who sell appliances on a commission basis during spare time.

LIGHTING LOAD QUADRUPLED



Floor covering department of a Buffalo store replaces lighting load of 4.525 kw. with a new installation of 32 Hygrade Sylvania 500-watt lamps in Art Metal fixtures, multiplying connected load for lighting almost by four

For Hard Usage . . .
your Best Bet is Amerclad



AMERCLAD "rubber armored" cords and cables are built to take punishment. Wherever portable conductors get rough usage—in mines, factories, garages or machine shops; in contact with oil, mud or acid waters—you are likely to find Amerclad on the job.

There are many sizes and types of Amerclad designed for many purposes — from slender cords that can be wrapped around your finger to high-voltage power cables as big as your arm. But, large or small, they are all Amerclad and all have the same protective jacket of tough "tire-tread" rubber.

We will be glad to send you free of charge our Amerclad catalog. It is profusely illustrated and describes a great variety of flexible, hard-wearing Amerclad All-Rubber Cords and Cables. Why not write us today.

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* • United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

New EQUIPMENT AVAILABLE

Mercury-Arc Rectifier

A small-capacity, permanently evacuated rectifier unit using a heat-resistant glass bulb as a vacuum chamber has been placed on the market. In contrast with the large steel tank water-cooled units, the airtight bulbs in these new units are said

Mercury-arc rectifier; offered in sizes ranging from 50 kw. at 250 volts to 300 kw. at 600 volts. **Allis-Chalmers Mfg. Co.,** Rectifier Division, Milwaukee, Wis.

to require neither vacuum pumps, vacuum gages nor cooling water, being air cooled by means of a small fan. The glass bulb is resiliently mounted in the upper portion of the cubicle structure; the lower portion contains the cooling fan and the panel supporting the ignition and excitation devices. Necessary transformers and circuit breakers for the unit may be placed in any location adjacent to the cubicle.

•

Rubber Mounting

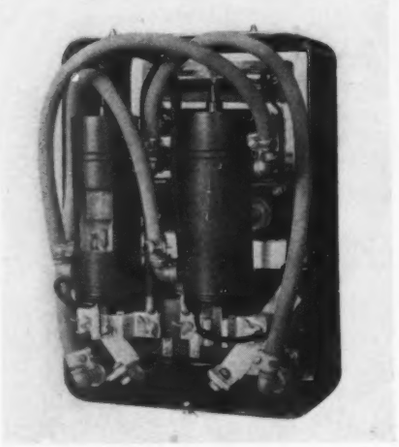
Type "40" "Vibro-Insulator;" one size only, 1 in. diameter and 1 in. long; maximum load in shear 10 lb. per mounting. **B. F. Goodrich Co.,** Akron, Ohio.

Since mounting requirements differ according to the nature of the service, electric motors requiring relatively stiff mountings, while delicate instruments need a soft, cushioning type, this company has brought out a rubber mounting with an adjustable deflection feature. Rubber is vulcanized to two parallel metal disks which are drilled and tapped for a 5/16 U.S.S. thread, the hole extending through the entire length of the mounting. Deflection is varied by the length of the attaching screws; with the screws penetrating nearly to the center of the device, a relatively stiff mounting results; with short screws, penetrating only the metal disks, a soft type is provided.

•

Welding Equipment

Recent welding developments of this company include: Ignitron contactors for spot projection and flash welders; an improved electronic type resistance welder; three new welding electrodes for shielded-arc welding of mild steel and "Glyptal," a preparation to prevent the adhesion of weld spatter. New contactor consists of two water-cooled, sealed-off ignitron tubes mounted on a composition panel with the control circuit. Tubes are so connected as to conduct full-wave a.c. to the welding machine when the control switch is closed, current flow ceasing when control switch is opened. New differential-pressure type flow switch provides water cooling. An ignitron tube and its associated control circuit time current flow in the secondary circuit of the resistance welder; current of several thousand amperes flows for a half-cycle. Control circuit includes dial for regulating heat by phase-shifting method.



Ignitron contactor; in these ratings: 150, 300, 900 and 2,500 amp.; electronic type resistance welder not shown. **General Electric Co.,** Schenectady, N. Y.

•

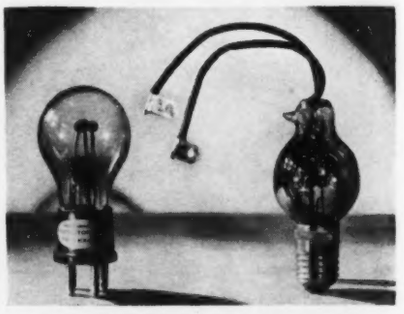
Vaporproof Lamp Guard

Vaporproof lamp guards; for 60- and 100-watt lamps, with or without built-in reflector. **McGill Mfg. Co.,** Valparaiso, Ind.

New lamp guard is offered for use on portable or extension lights where inflammable gases, liquids or materials may present hazards. Globe of Pyrex glass is pressed into a pliable rubber gasket at the base, which serves as an airtight seal. Handle is of fire-resisting and breakproof "Insurok"; cage and hook are of brass.

Protector Tubes

A gas-filled protector tube designed for indoor service has been developed to protect supervisory control line wires and



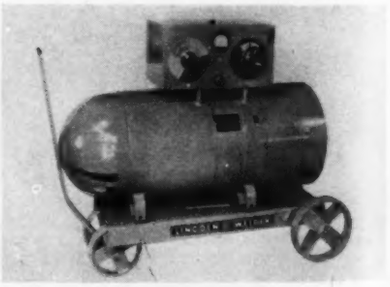
Gas-filled protector tube with industrial base; gas provides current-carrying path of 50 amp. for two seconds. **Westinghouse Electric & Mfg. Co.,** East Pittsburgh, Pa.

telephone lines from over-voltages caused by lightning and direct contact with or induction from nearby power lines. Protector is of the discharge-gap type with the gaps inclosed in a glass bulb containing inert gas at a low pressure. One electrode is connected to ground and the two others to lines being protected. When an abnormal voltage disturbs the line the tube breaks down and discharges the disturbance to ground, ceasing to discharge when voltage of disturbance is reduced. Where induction is especially severe line wires may be continuously grounded through transformers in conjunction with protector units.

•

Arc Welders

To the dual continuous control of this company's line of arc welders has been added a self-indicating feature—calibrated "job selector" and current control dials indicate the type of work and number of amperes for each setting. On all types the welding generator is separately excited. On the a.c. motor-driven welders self-protected motor is said to permit sus-

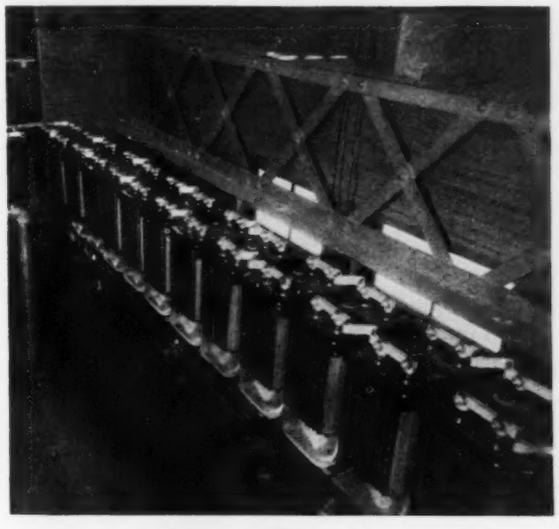


"Shield-Arc" welder, a.c. motor-driven type, illustrative of line. **Lincoln Electric Co.,** Cleveland, Ohio.

Swing bridge over Portage Lake, Mich., owned by the State of Michigan and operated by the Copper Range Railroad. The present span is 1457 feet long with swinging section 290 feet in length. Upper deck carries vehicle traffic; lower deck, railroad tracks. Entirely self-contained power plant is located in operating cab.

FOR 32 YEARS THIS HEAVY SWING BRIDGE HAS BEEN OPERATED BY EXIDE-CHLORIDE

...and now another battery of the same type has just been installed to carry on



Part of the 58-cell Exide-Chloride Battery that has just been installed in the operating cab of the bridge to ensure unfailing operation for many more years to come.

WHEN in 1905, due to the failure of its steam power plant, the 180 ft. swinging section of the Copper Range Railroad Bridge refused to open, it was rammed by a heavily loaded lake steamer. As a result, bridge officials and engineers decided that power of a more dependable nature was needed to operate the two 25 h.p. d.c. series motors designed to turn the new 290 ft. section built in 1906.

After careful consideration of all possible sources of dependable power, a 58-cell Exide-Chloride Battery of 400 a.h. capacity was chosen—not only to turn the bridge, but to operate the two 7½ h.p. series motors that lift the rail ends and thus break the rail connections which allow the bridge to open.

To charge the battery, two 25 h.p. single cylinder gasoline engines were installed, each connected to a 20 k.w., 150 volt generator. These engines are so arranged however that, in case of an emergency, they can be operated as compound units, supplying power direct to the bridge motors.

In the 32 years that this bridge has been in operation, the continued use of Exide-Chlorides—as replacement became necessary—reflects the high regard in which these batteries are held by bridge officials.

Why not use Exide-Chloride Batteries for all stationary services in your plant? They'll serve you faithfully for years, with minimum care and maintenance. Write for Bulletin 204 describing this unusual battery. Learn why it's the choice of engineers all over the world.

Exide
CHLORIDE
BATTERIES

To mark the fiftieth anniversary of Exide Batteries, a handsome souvenir booklet has been prepared, illustrating the essential part these batteries play in daily life. Write and we will gladly send you a free copy.

THE ELECTRIC STORAGE BATTERY CO.

The World's Largest Manufacturers of Storage Batteries for Every Purpose

PHILADELPHIA

Exide Batteries of Canada, Limited, Toronto

HOTEL ENGINEER SAVED $3600 BY "MEGGER" TESTING

CHALFONTE-HADDON HALL
Atlantic City, N. J.

POWER failure and "lights out" are simply unthinkable in a hotel as fine and popular as Atlantic City's *Chalfonte-Haddon Hall.* The Chief Engineer avoids trouble and protects the hotel and its guests by periodic insulation resistance tests with a "Megger" Insulation Testing Instrument. He tests "everything,"—generators, cables, motors, elevator equipment and wiring.

One day, for example, a routine test disclosed—quite unexpectedly—an incipient weakness in the insulation of the cables leading to one of the 500-kw generators. A short circuit was thereby forestalled and saved (1) a minimum of $3600, including repairs to the machine and 2000 feet of cable, and (2) an embarrassing and costly shutdown.

The Management of Chalfonte-Haddon Hall knows how little it costs to do an *efficient* electrical maintenance job based on "Megger" testing,—that there is simply no comparison between the "Megger" *preventive maintenance* plan and the old chase-trouble-after-it-happens method.

If you ought to be making "Megger" tests, write today for our informative "Megger" Catalog 1550-W.

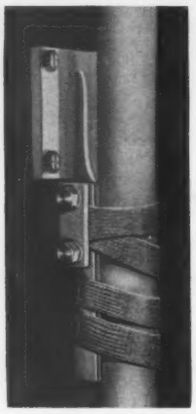
JAMES G. BIDDLE CO.
ELECTRICAL INSTRUMENTS
1211-13 ARCH STREET PHILADELPHIA, PA.

tained operation with large-sized electrodes at high average welding currents without danger of burnout.

•

Cable Support Clamps

Secure support for lead-covered and armored cables in all positions is claimed for a wrapped braid clamp recently announced. Bodies of the clamps are of galvanized cast iron. Braid, of strands timed before weaving, is wound about the cable and clamp body, nesting in corrugation in the latter.

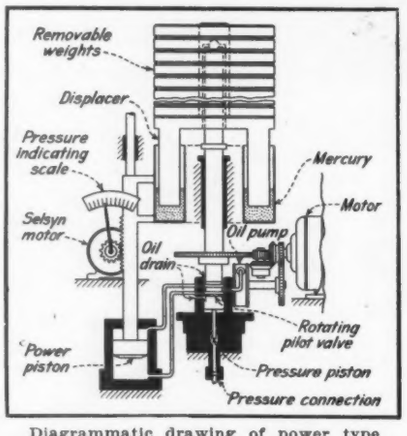


Cable support clamps; two types, "MRD," in eight sizes for cable up to 2¾ in for vertical cable runs and for attachment to flat surfaces; "CED," in ten sizes for bolt attachment and for vertical, horizontal and angular runs. **Electrical Engineers Equipment Co.,** Melrose Park, Ill.

•

Power Type Pressure Gage

New power type gage for the measurement of high pressures provides readings on an indicating scale and will also transmit them to indicators and recorders located at distant points. Pressure to be measured is applied to a small pressure piston supporting a pilot valve and a table loaded with removable weights, which, less the buoyancy of the mercury on the skirt of the weight table, counterbalances the applied pressure. A small motor rotates the pressure piston and pilot valve to eliminate static friction; removable weights and weight platform do not revolve. This motor also drives a small oil pump which provides hydraulic pressure through the pilot valve for operation of a power piston, which in turn moves the mercury cup, the indicating pointer and the Selsyn motor for electrical transmission of readings.



Diagrammatic drawing of power type pressure gage; available for maximum range of 12,000 lb. per sq. in. **Bailey Meter Co.,** Cleveland, Ohio.

•

Single-Conductor Pothead

On this new outdoor capnut, single-conductor pothead are employed solderless clamp style internal and external connectors using a separate clamping plate which accommodates one range of conductor sizes in one position and another range with the plate reversed, simplifying stock keeping.

External lug is designed so aerial conductor can be clamped vertically or horizontally merely by turning the clamp plate through 90 degrees. Base sealing fitting is a stuffing box style, using oil-proof molded rubber squeeze bushing. Hole in this bushing can be varied for different cable diameters.

Type "T" pothead; 7,500-volt, 250 and 500 amp. **G & W Electric Specialty Co.,** Chicago, Ill.

•

Valve Operator

This valve control consists of a motor-driven combination helical and worm gear reducing mechanism which bolts to a pad on the side of the valve yoke. Output shaft of the device is connected to valve stem or yoke nut through a pair of spur gears. Lost motion device built into the machine allows motor to attain full speed before stem load is encountered, this device producing a "hammer blow" which unseats or starts the valve in motion. "Torque" spring and switch seats the valve. Magnetic reversing controller is required to operate the motor; a three-button push-button station is standard.

"Limitorque" type JS valve operator; standard motor supplied is ¼-hp., 110-volt, 25- to 60-cycle, single-phase, universal type. **Philadelphia Gear Works,** Philadelphia, Pa.

•

Direct-Set Controller

Direct-set indicating controller; 5½-in. graduated scale. **C. J. Tagliabue Mfg. Co.,** Brooklyn, N. Y.

Indicating and controlling pointers are on the same scale in this new indicating controller for temperature and pressure. Two types are offered—an "on-off" model which opens or closes the diaphragm valve when the temperature or pressure falls below or rises above the setting point, and a "throttling" type, using a flapper mechanism, which provides for adjustment from "hairline" to 100 per cent throttling range.

New REA Allotments; Contracts Approved

REA has announced allotments totaling $8,611,000 for 47 projects in 24 states. This brings allotments made since REA was established in 1935 to $169,175,710.

Among the recent allotments are the following:

ARKANSAS—Clay County Electric Co-operative Corporation, L. A. Scrivener, president, Piggott, $300,000 to build 270 miles of line, 1,061 members in Clay, Randolph and Greene counties.

GEORGIA—North Georgia Electric Membership Corporation, W. L. Manton, superintendent, Dalton, $312,000 to build 123 miles of line, 677 members in Catoosa, Chatooga, Floyd, Gordon, Murray, Walker and Whitfield counties.

ILLINOIS—Southeastern Illinois Electric Co-operative, Inc., B. D. Gates, president, Harrisburg, $811,000 to build 627 miles of line, 2,629 members in Hardin, Franklin, Hamilton, White, Williamson, Saline, Gallatin, Johnson and Pope counties., Tri-County Electric Co-operative, Inc., A. E. Drennan, president, Mt. Vernon, $507,000 to build 445 miles of line, 1,527 members in Marion, Jefferson and Washington counties.

IOWA—Buchanan County Rural Electric Co-operative, Norman S. Frye, president, Independence, $293,000 to build 271 miles of line, 735 members in Buchanan, Blackhawk, Delaware, Clayton and Fayette counties.

KANSAS—C & W Rural Electrification Co-operative Association, Inc., Fred J. Yarrow, president, Clay Center, Kans., $276,000 to build 275 miles of line, 717 members in Clay County. Flint Hill Rural E'ectric Co-operative Association, L. G. Olson, president, Council Grove, $523,000 to build 538 miles of line, 1,311 members in Morris, Marion, Chase and Geary counties.

KENTUCKY—Nolin Rural Electric Co-operative Corporation, W. R. Crawley, president, Elizabethtown, $328,000 to build 313 miles of line, 1,000 members in Hardin and LaRue counties.

MINNESOTA—Minnesota Valley Electric Co-operative, William Saltmarsh, superintendent, Jordan, $271,000 to build 243 miles of line, 605 members in Scott, Carver, Sibley, LeSeuer, and Rice counties.

MISSOURI — Pemiscot-Dunklin Electric Co-operative, John W. Asher, superintendent, Hayti, $379,000 to build 341 miles of line, 1,703 members in Dunklin, New Madrid and Pemiscot counties.

NEBRASKA—Eastern Nebraska Public Power District, F. A. Martz, superintendent, Syracuse. $871,000 to build 803 miles of line, 2,015 members in Cass, Otoe, Nemaha, Richardson, Pawnee, Gage and Johnson counties. Dawson County Public Power District, Albert Kjar, president, Lexington, $318,000 to build 272 miles of line, 636 members in Dawson, Gosper, Lincoln and Buffalo counties.

TENNESSEE—Cumberland Electric Membership Corporation, M. C. Northington, superintendent, Clarksville. $563,000 to build or acquire 560 miles of line, 2,686 members in Stewart, Houston, Montgomery, Cheatham, Robertson, Sumner and Montgomery counties.

TEXAS—Farmers Electric Co-operative Inc., Charles M. Curfman, superintendent, Greenville, $215,000 to build 221 miles of line, 860 members in Hunt, Delta, Wood, Rains, Collin, Hopkins, Kaufman, and Rockwall counties. Cherokee County Electric Co-operative Association, R. R. Banks, president, Rusk, $276,000 to build 340 miles of line, 858 members in Cherokee, Smith and Rusk counties.

Construction contracts:

Planters Electric Membership Corporation, Waynesboro, Ga., J. B. Bargeron, superintendent, contract to Harvey and Quina, Pensacola, Fla., for building second section of project, 175 miles of line, 466 customers; bid $84,909. Excelsior Electric Membership Corporation, Metter, Ga., Cleo E. Miles, superintendent, contract to J. V. Tillman, Statesboro, Ga., for building first section of project, 307 miles of line, 936 customers; bid $151,918.

Rural Electric Convenience Co-operative Company, Divernon, Ill., Charles Masters, superintendent, contract to Sheehan Pipe Line Construction Company, Tulsa, Okla., for building another section of project, consisting of 113 miles of line, 254 customers; bid $79,188.

Eastern Iowa Light & Power Co-operative, Davenport, Iowa, S. N. Jordan, superintendent, contract to Monroe Electric Company, Chicago, for building another section of project, 138 miles of line, 287 customers; bid $96,588.

Benton County Electric Co-operative, Vinton, Iowa, Ivan E. Trottnow, superintendent, contract to Elkhorn Construction Company, Norfolk, Nebr., for building another section of project, 112 miles of line, 256 customers; bid $78,670.

Taylor County Rural Electric Co-operative Corporation, Campbellsville, Ky., Ferrill Greagory, superintendent, contract to F. W. Owens Company, Louisville, for building entire project, 154 miles of line, 427 customers; bid $99,545.

Fox Creek Rural Electric Co-operative Corporation, Lawrenceburg, Ky., G. R. Sandidge, superintendent, contract to Fritz Ziebarth, Long Beach, Calif., for building first section of project, 172 miles of line, 411 customers; bid $117,860.

Valley Electric Membership Corporation, Natchitoches, La., E. J. Giering, Jr., superintendent, contract to Brown and Root, Inc., Austin, Tex., for building second section of project, 143 miles of line, 450 customers; bid $92,328.

South Louisiana Electric Co-operative Association, Houma, La., N. H. Penrose, superintendent, contract to O. O. Fuller Company, Nevada, Mo., for building first section of project, 113 miles of line, 301 customers; bid $64,417.

Southern Pine Electric Power Association, Taylorsville, Miss., Marion W. Schwartz, engineer, contract to W. L. Coston and Sons, Bessemer, Ala., for building first section of project, 107 miles of line, 152 customers; $164,714.

Norris Rural Public Power District, Wilber, Nebr., A. M. Vasak, superintendent, contract to Schneider Electric Works, Omaha, for building another section of project, 158 miles of line, 270 customers; bid $96,850.

Paulding-Putnam Electric Co-operative, Inc., Paulding, Ohio, V. E. Patterson, superintendent, contract to Davis-Hydaker Company, Spencerville, Ohio, for building third section of project. 317 miles of line, 1,035 customers; bid $227,906.

Claverack Electric Co-operative, Inc., Towanda, Pa., C. E. Jakway, manager, contract to Sordoni Construction Company, Forty-Fort, Pa., for building second section of project, 296 miles of line, 1,200 customers; bid $277,693.

From the viewpoint of every man concerned with line construction and maintenance, Chance Anchors are a sound investment.

To management they mean line security — protection for capital invested in line construction.

From the purchasing department Chance Anchors get first consideration for many reasons—quality, dependability, price, adaptability to various needs, integrity of the manufacturer, and delivery service.

To construction superintendents the Chance complete line provides the right anchor for every job—dependable, economical results.

The Engineer relies on fact, fact proven by test. He knows that every Chance Anchor will do the job for which it is made because it has been proven.

To the store keeper Chance Anchors mean a complete, all round, stock from a single source of supply; an anchor for every requirement and a stock easily checked by Chance metal tags.

The line foreman selects Chance Anchors because he can be assured of a job well done in minimum time.

To the lineman Chance Anchors represent a better job with less effort — an anchor to meet each specific requirement, easier installation, easier handling and better results.

Build Security into your lines. Select your anchors from the complete Chance line of 18 types and 75 sizes.

A·B·CHANCE CO. Dept. B
Utilities Division
CENTRALIA MISSOURI

Manufacturing AND MARKETS

Westinghouse to Pay for Overtime Work

Anticipating by three years the final provision of the labor standards act, Westinghouse Electric & Manufacturing Co. will begin paying overtime immediately to all salaried non-exempt employees working in excess of 40 hours a week.

George H. Bucher, president, estimated about 12,000 salaried employees will be benefited by the decision. The plan will be made retroactive to October 24, when the act went into effect. The company's policy is to put the full requirements of the act into force at once, Mr. Bucher declared.

It was stated by Mr. Bucher that the company has consistently followed the practice of shortening working hours and improving working conditions as rapidly as improved techniques and industrial conditions permitted. Hourly paid employees were on the 40-hour week prior to the passage of the act, he said.

•

Oil Burner Shipments

Domestic shipments of oil burners during October amounted to 20,637 units, as against 25,821 in September and 24,228 in October last year, according to the Department of Commerce. For the first ten months domestic shipments were 114,906, compared with 169,443 in the same period last year.

•

Air Unit Contracts Let by I.T. & T. Subsidiary

Two additional contracts have been signed by the International Standard Electric Corporation, International Telephone & Telegraph Corporation subsidiary, with the Mills Novelty Company of Chicago and the Baker Ice Machine Company of Omaha. It announced a contract with the Gibson Refrigerator Company, Greenville, Mich., several weeks ago.

Contracts provide for manufacturing rights and technical assistance and the I.T. & T. plans eventually to manufacture these air-conditioning equipments in several of its European factories. For the present, however, they will be exported and marketed abroad under the Standard Electric trademark. Several new lines of manufacture have been added for the factories in Belgium, England, France, Germany and Australia, with electric refrigeration potentially the most important.

•

Air Unit Orders Advance in October

Total value of orders reported by 125 manufacturers of air conditioning systems and equipment in October amounted to $3,436,197, compared to $3,891,050 in October last year, according to a report issued by the Department of Commerce. However, the bureau reported, orders booked in October showed a 12.6 per cent increase over the $3,052,460 total in September.

Total orders for both systems and equipment in the first ten months of the year showed a sharp decrease from the similar period last year. This year's orders totaled $35,044,076 compared with $56,150,918 in the ten-month period of 1937.

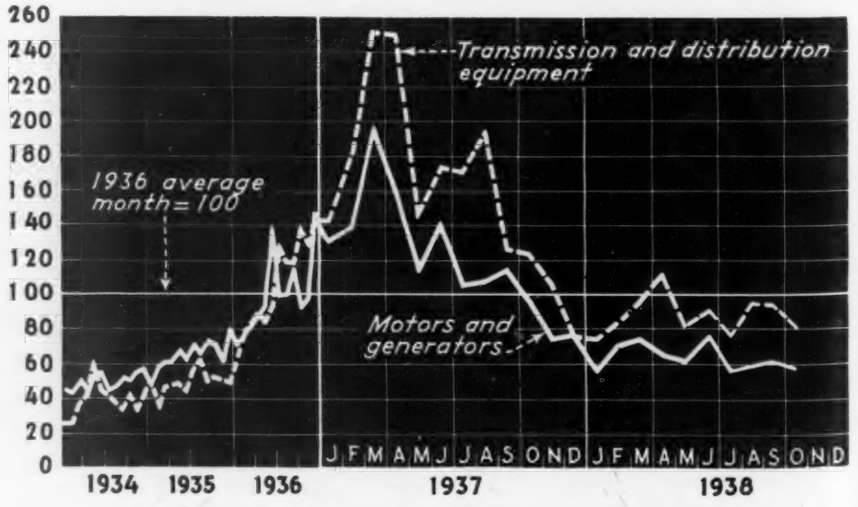
Equipment Orders Decline Seasonally

Value of orders for motors and generators in October decreased by 5.7 per cent compared with September, according to the N.E.M.A. index, which decreased 3.6 points to 59.1. The change was in line with the usual seasonal movement, and compares with changes successively of —2.3, —2.1, —19.7 and —14.2 per cent during the preceding four years. The decline was much smaller than in 1936 and 1937.

This group comprises a.-c. generators (excluding waterwheel and turbo-generators), a.-c. and d.-c. motors (1–200 hp.) and synchronous motors (1 hp. and larger).

The index for transmission and distribution equipment declined more sharply, by 11.3 points or 12.2 per cent to 80.4. The downward movement this year was in contrast with a general rise in other years, the changes beginning with 1934 having been successively +30.0, +6.0, +16.1 and —1.4 per cent.

	Motors and Generators		Transmission and Distribution	
Month	1937	1938	1937	1938
June	140.4	76.0	172.8	89.3
July	105.6	59.1	170.4	76.9
August	107.5	60.2	193.4	95.7
September	113.4	62.7	125.2	91.7
October	97.4	59.1	122.7	80.4



N.E.M.A. Index of orders received for motors and generators and for transmission and distribution equipment

Manufacturers Make Sales Assignments

Electrical manufacturing companies have recently announced the following additions to their sales staffs:

Two new distributors to handle Leonard refrigerators have been announced by Ray Legg, general sales manager, Leonard division, Nash-Kelvinator Corporation. Harry T. Wilson, Inc., Memphis, Tenn., will distribute the Leonard line in northern Mississippi, western Tennessee and northeastern Arkansas. Forty counties in central Indiana will be covered for Leonard by United Distributing Corporation, Indianapolis.

Curtis Lighting, Inc., has transferred Harry Nicol, Boston representative, to Albany, N. Y. He has been succeeded in the New England territory by Lawrence S. Cooke, formerly of the company's Chicago staff.

Appointment of A. H. Matthews, W. W. Halsey and R. J. Stanton as special sales representatives has been announced by the Gould Storage Battery Corporation. These men were formerly associated with the USL Battery Corporation. Mr. Matthews joins Gould as a special representative for railroads, working from Chicago. Mr. Halsey will be sales representative for the company's New York division. Mr. Stanton will be special sales representative at the head office, Depew, N. Y.

•

Will Build $300,380 Line

Greenwood County Finance Board, Greenwood, S. C., has awarded a contract to R. H. Bouligny, Charlotte, N. C., for the construction of a transmission line in Greenwood County, connecting the city with the new county hydro-electric power plant at Buzzard's Roost power dam, now under way, at a price of $300,380. The line will be about 85 miles long.

•

Moloney Declares Dividend

Moloney Electric Company has declared a dividend of $1 per share on the "A" stock, which was payable December 15. This is the initial disbursement this year. Last year $5 was paid.

•

G.E. Renews Radio Hour

General Electric has renewed its Hour of Charm over 58 coast-to-coast stations of the NBC Red network, effective January 2. The broadcast is heard on Mondays from 9 to 9:30 p.m., E.S.T.

New York Metal Prices

	Dec. 7, 1938 Cents per Pound	Dec. 13, 1938 Cents per Pound
Copper electrolytic	11.25*	11.25*
Lead Am. S. & R. price	4.85	4.75
Antimony	11.75	11.50
Nickel ingot	35.00	35.00
Zinc spot	4.89	4.89
Tin straits	46.50	45.95
Aluminum, 99 per cent	20.00	20.00

* Delivered Connecticut Valley.

Field Reports on Business

Seasonal influences are having their effect on business. Retail establishments find that the volume of goods is high, but dollar sales are under a year ago. Selective purchases are the rule. Electrical appliances are in demand. Electrical equipment orders remain spotty, with inventory adjustments being made.

NEW YORK

Seasonal influences are being felt in many lines of the electrical industry. Christmas retail trade is holding up well, with indications that electrical goods show substantial movement this season. Many stores are featuring this type of "gift" merchandise. Utilities report their displays are attracting customers in large numbers. The Consolidated Edison sales drive has done much to stimulate customer consciousness of the advantages of electrical appliances.

Christmas lighting is being featured by the nation's utilities. Backing has been obtained from civic organizations in many instances, with the result that the lighting load is due for a big jump this season.

With construction contracts during November the highest for that month since 1929, and 52 per cent ahead of 1937, indications are that the building industry will turn the new year in a position to lead to expanding business activity. Just what part the utilities will actually play in this movement is yet to be seen. Early estimates on 1939 budgets indicate that the integration provisions of the utility act and continued hostile government attacks are having an undesirable effect. Utilities well situated are going ahead with plans to expand plants and generating capacity.

One air-conditioning concern announced that it is about ready to place orders for more than $4,000,000 of materials, apparatus, refrigeration and electrical equipment in connection with contracts which it has assumed.

PACIFIC COAST

Practically no rain has fallen this season in California, forecasting a prospective heavy spring demand for pumping outfits, in contrast to 1938, when the usual demand for staple sizes of motors, transformers and meters dropped 50 per cent because of a record rainy season. This dry condition, however, has helped building volume and the November total for seven Western states was 85 per cent over November last year.

Bonneville will be requesting bids in January for line and substation construction for carrying power into the Washington area, the estimated cost being $3,000,000 for labor and $7,000,000 for material. A Seattle contractor has been awarded the order for six navy destroyer electrical equipments, said to be the largest order ever given a Seattle electrical firm.

Other government machinery business includes a $374,560 low bid by Westinghouse covering three turbo-alternators and accessories for Pearl Harbor naval station near Honolulu; $9,000 of 833-kva. circuit breakers for Indian irrigation service in Arizona and requests for bids from Los Angeles headquarters for heavy motors for Indian service near Flathead, Mont.

Lighting material, which is now no longer a seasonable line, is selling particularly well in the Bay area. The Pacific Gas & Electric Company is refloodlighting its San Francisco headquarters with approximately 300 floods, costing about $15,000, and the California Building and many private exhibits at the exposition are providing about $100,000 lighting business now being figured.

NEW ENGLAND

Orders for special-purpose motors included in several large contracts reported in this district recently aggregate 1,400 hp. spread over nine large mechanical draft fans which will be manufactured by the B. F. Sturtevant Co., Hyde Park, Mass., for a Pacific Coast utility. A group of interesting elevator installations which will be motor driven and have electric automatic control have been announced.

Interest in motor-driven pumping equipment is reflected in recent purchases of three 100-hp. motor-driven pumps for new water service at Framingham, Mass.; two 25-hp. motor pumps have been bought for installation in western Massachusetts and about 400 hp. will be required for motor-driven pumps which are contemplated for an extension to service in a Vermont city.

Central Maine Power Company added 240 miles of rural lines and 3,171 kva. substation capacity this year; 57.58 miles of rural lines and 2,000 kva. in substation capacity were added by the Central Vermont Public Service Corporation during this same period.

Wiring supplies for power and light continue to maintain good volume. Electrical appliance buying is reacting very favorably; small domestic cooking apparatus, irons and washing machines are receiving much attention.

CHICAGO

It became increasingly apparent last weeks that the disposition of business in general will be to coast along for the balance of the year. There was a noticeable slackening in the pace of most lines of activity, with the exception, of course, of trade incidental to the holidays. Retail trade forged rapidly ahead, with the result that sales are expected to reach a highly satisfactory volume.

The demand for steel tapered off to the extent that production declined several points. Electrical power output showed a slight reduction from the previous week, but remained 6 per cent above a year ago. Orders for electrical apparatus were moderately lower, but the increasing number of inquiries indicates a pronounced improvements may be expected in the early part of next year.

Increased effort on the part of contractors to sell wiring modernization on the E.H.F.A. time payment plan is bringing very gratifying results. Steady gain in the number of jobs secured is reported each week. Although contracts awarded on PWA work have eased up, there remains a substantial amount of electrical business available from that source. Retail outlets report a good demand for electrical appliances. Industrial lighting equipment sales are steadily improving. One cable manufacturer reports an order for 42,240 ft. of paper-insulated, lead-sheathed fire alarm cable.

News ABOUT PEOPLE

Burnham of Allis-Chalmers Resigns; Edsall Appointed

Resignation of George A. Burnham as assistant manager of the electrical department, in charge of switchgear sales and engineering division of the Condit Works of the Allis-Chalmers Manufacturing Company, Boston, Mass., has been announced. He will be succeeded by W. S. Edsall, sales manager. Mr. Burnham is being relieved of his duties at his own request, as he is anxious to devote more time to personal affairs and to travel. In the future he will be retained by Allis-Chalmers in a consulting capacity.

About three years after the Condit Electric Manufacturing Company was sold to the American Brown-Boveri Electric Corporation Mr. Burnham was elected president of the electrical subsidiary, the American Brown-Boveri Company, Inc. After the purchase by Allis-Chalmers of certain electrical interests of American Brown-Boveri Company, Inc., Mr. Burnham continued as president and treasurer of the Condit Electric Manufacturing Corporation until 1937, after which the Condit plant was operated as a branch of Allis-Chalmers. At this time he was made assistant manager of the electrical department of Allis-Chalmers, in charge of sales and engineering of all switchgear, switchboard and industrial control business at both the Condit and West Allis works.

G. A. Burnham

W. S. Edsall

At the end of the World War Mr. Edsall, who had served in the U. S. Navy, entered the employ of the Sperry Gyroscope Company. In 1920 he became identified with the Condit Electric Manufacturing Company of Boston and was made sales manager in 1922. In 1928 he was appointed general sales manager of the American Brown-Boveri Company and also a director of the Condit Electric Manufacturing Corporation. When Allis-Chalmers purchased these companies in 1931 Mr. Edsall continued his connection with them as manager of sales for the Condit works and later for the switchgear division, with headquarters at Condit works.

•

▶ GEORGE E. PFISTERER, for the past ten years secretary of the Midwest Power Conference, has entered the power sales department of the Commonwealth Edison Company, Chicago, as engineer, industrial power service.

▶ OSBORNE MITCHELL managing editor of *Electrical News & Engineering*, a Canadian publication, has relinquished his editorial duties to become acting secretary of the Hydro-Electric Power Commission of Ontario.

Goris Made Vice-President of Gary Utility Properties

C. W. Goris, formerly comptroller of the Northern Indiana Power Company, has been elected vice-president and general manager of the Gary Heat, Light & Water Company, Gary, Ind. Paul Stark of Indianapolis has been elected comptroller of Northern Indiana Power to succeed Mr. Goris.

Mr. Goris has had long experience in the utility field, having been first employed in 1915 by the utility properties in Lafayette, which now are part of the Public Service Company of Indiana. In 1924 he became chief clerk of the utility company operating in Fort Wayne and four years later was employed by the Midland United Company, the holding company for operating properties in Indiana. In 1930 Mr. Goris was transferred to the Public Service Company of Indiana, the position he held until his election as comptroller of Northern Indiana Power in 1937. In going to the Gary company Mr. Goris will fill the vacancy caused by the death of A. V. Grief.

Dezheimer-Carlon Studio

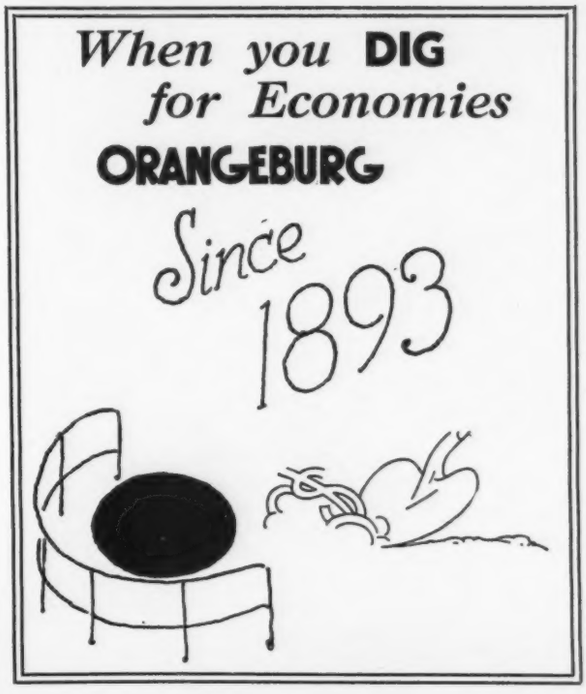
Mr. Stark has spent practically his entire utility career of twenty-six years in Indiana, first with the Indianapolis Water Company, then with the Indiana Public Service Commission, and later as general auditor of the Eastern Wis-

• *When you "dig" for "distribution"*

you consider not only immediate costs but the ultimate economy of a substantial capital investment.

Where good engineering practice requires concrete encasement, as in duct banks, main distribution, high tension and "downtown" underground, Orangeburg Standard Fibre Conduit offers not only immediate savings but complete and permanent cable protection and raceway facilities.

ORANGEBURG *Standard* FIBRE CONDUIT for use Underground WITH Concrete Encasement



Now ORANGEBURG NOCRETE *the new Dual Economy* CONDUIT

For use underground *WITHOUT* Concrete encasement

Where good engineering practice suggests installations of conduit without concrete encasement; Orangeburg NOCRETE offers real savings in both initial material and installation costs. Its cost is about 50% that of metal pipe and *less* than non-metallic conduits of any comparable quality. Naturally installation costs are much lower,—easier to handle—easy to cut or tool—adaptability to rounding curves or obstructions—and quick field assembly.

Specify Orangeburg NOCRETE for service entrances, extensions, parkways and street lighting, suburban services, laterals, etc. Save money not only TODAY but also *in the future* from many years of service without maintenance costs.

THE FIBRE CONDUIT COMPANY — *Sales Office* **292 MADISON AVENUE, N. Y.**

Sales Agent **GENERAL ELECTRIC SUPPLY CORP.** — *Sales Agent* **GRAYBAR ELECTRIC COMPANY, INC.**

consin Electric Company at Sheboygan. In 1920 he became associated with the Wisconsin-Minnesota Light & Power Company at Eau Claire, Wis. Returning three years later to Indiana as general auditor of the Central Indiana Power Company subsidiaries, which included the Northern Indiana Power Company, in 1929 he was transferred to the Public Service Company of Indiana.

•

▶ QUINTON E. EDDINS of Birmingham, Ala., has been named manager of the Decatur municipal power system. Mr. Eddins was associated with the Alabama Power Company for 19 years and prior to that connection was with the Birmingham Electric & Manufacturing Company.

▶ D. G. PEPPER of Lexington, Miss., has been selected for the managership of the new municipal light plant at Paragould, Ark., and expects to assume his duties before January 1. The city is constructing the plant with PWA funds.

▶ W. H. MILTON, JR., has been appointed manager of sales for the plastics department of the General Electric Company, Pittsfield, Mass., to succeed the late K. W. Nelson. Following test and engineering experience in the General Electric's Schenectady and Pittsfield works, in 1925 he was transferred to sales duty in the Philadelphia office, where he remained until the present promotion.

▶ WALTER B. STRONG has been appointed assistant general sales manager of the Worthington Pump & Machinery Corporation. Formerly manager of the corporation's export division, in his new assignment Mr. Strong will continue general supervision of export sales and will also be identified with certain phases of domestic sales work. GEORGE GELLHORN, JR., will succeed Mr. Strong as manager of the export division.

▶ J. TRUMAN STEINKO has been appointed advertising and sales promotion manager for Nash-Kelvinator Corporation's Leonard division. For the past several years Mr. Steinko has been a member of the corporation's advertising and sales promotion staff. He joined the organization in 1934 to head up trade paper publicity following a year as editor and business manager of the Garden City (Mich.) *Herald*. Mr. Steinko left the appliance industry in 1935 to become sales promotion manager for Ray Day Piston Corporation of Detroit, returning early in 1936 to specialize on household appliance sales promotion for Kelvinator and Leonard. He is a graduate of the University of Michigan.

A. A. Gray New President Electrical League Groups

A. A. Gray, recently elected president of the International Association of Electrical Leagues, has been connected with the electrical industry since 1900, when he entered the employ of the magazine *Electrical Review* as a proofreader. Advancing through editorial and management capacities, he was vice-president and general manager of this publication when it was moved from New York to Chicago and combined with the *Western Electrician* in 1908.

Later he organized his own advertising agency, which he operated until

1934, when he became manager of the Electric Association of Chicago. He had been secretary of the association since its formation in 1925. He was an organizer and served as president of the Associated Business Papers. By his long experience in technical journalism, in advertising and in other industry promotional activities Mr. Gray is well qualified to head the International Association of Electrical Leagues.

OBITUARY

Percy C. Day

Percy C. Day, vice-president and chief engineer of the Falk Corporation, Milwaukee, died December 7 at his home in Elm Grove, after a short illness. He was 63 years of age. Mr. Day was born in England. He helped develop electric furnaces and did pioneer work in electrical metallurgy. He was credited with having designed, built and operated the first commercial plant producing calcium carbide in the British Isles and was inventor of a number of patents relating to gear type equipment, transmission and large drives for roller mills.

Mr. Day came to the United States in 1910, joining the Falk Corporation as chief engineer to direct the work of pioneering helical and herringbone gearing in the United States. He was named vice-president in 1937.

•

▶ HUGH L. BARGION, a pioneer in the electrical industry in the Northwest, who rose to the district managership of the Westinghouse Electric Supply Company with headquarters in Seattle, died in that city November 26. He was fifty years of age. Mr. Bargion had been connected with the industry for 33 years and at the time of his death was manager of the Washington, Oregon, Idaho, Montana and Alaska territories.

▶ JOHN H. KNAPP, vice-president and general manager of the Norge and Detroit Vapor Stove divisions of the Borg-Warner Corporation, died December 2 in his home in Detroit, in his forty-fifth year. A leader in the home appliance industry, Mr. Knapp played a conspicuous part in the growth and development of the Norge organization. With Howard E. Blood and C. D. Blood he formed the Norge Rollator Refrigeration Company in 1926, and in 1929 they merged with Borg-Warner.

▶ CLIFT B. KEYES, manager of the New York district transportation department of the General Electric Company, died at his home in Mount Vernon, N. Y., December 7, following a long illness. He was 61 years of age. In the course of his association with the General Electric Company, which dates back to 1899, Mr. Keyes established a wide acquaintanceship among men in the transportation field. He was extremely active in the electrification of the New York Central Terminal. He was a member of numerous engineering societies, including the American Institute of Electrical Engineers, American Transit Association, Railroad and Machinery Club.

▶ JAMES S. CAIN, who was one of the first of the early Western pioneers to vision the possibilities of hydro-electric development, died October 31 in San Francisco. Mr. Cain went to Bodie, one of the famous Nevada mining camps of the early days, in 1879, at the age of 26. His entire life was devoted to mining and allied interests. He was identified with one of the first hydro-electric power projects in the United States, which included a plant on Green Creek north of Lundy and the construction of one of the earliest transmission lines which carried this power to the Standard and other mines in Bodie. He was affiliated with the Pacific Power Corporation, which pioneered the Mono Basin power development, later taken over by the Nevada-California Electric Corporation in 1916.

Rural Kva. Profitably Released by Capacitors

[*Continued from page 36*]

It is sometimes argued that capacitors are not needed on rural lines because the charging kva. of the line itself provides a considerable amount of reactive correction and gives a substantial voltage rise. The charging kva. per mile of circuit for the conductor size and voltage classes of the above discussion are given in the following table:

Wire Size	Line Voltage 2.3 Kv.	4.16 Kv.	4.6 Kv.	6.9 Kv.	13.2 Kv.
No. 6	0.0138	0.0452	0.0552	0.124	0.454
No. 4	0.0142	0.0465	0.0569	0.128	0.468
No. 2	0.0149	0.0504	0.0595	0.134	0.489
No. 2/0	0.0158	0.0516	0.0630	0.142	0.519

It is interesting to note that in practically no case is the charging kva. as great as the probable transformer exciting kva. of the line even at light load densities.

It is of further interest to note voltage rise which this charging kva. produces on lines of different lengths. This voltage rise in per cent is very nearly constant for a given length of line, being practically independent of wire size and voltage class. For the lines considered above this rise is approximately

5 miles of line—0.0052 per cent
10 miles of line—0.0208 per cent
20 miles of line—0.0835 per cent
30 miles of line—0.1875 per cent

These values are practically negligible.

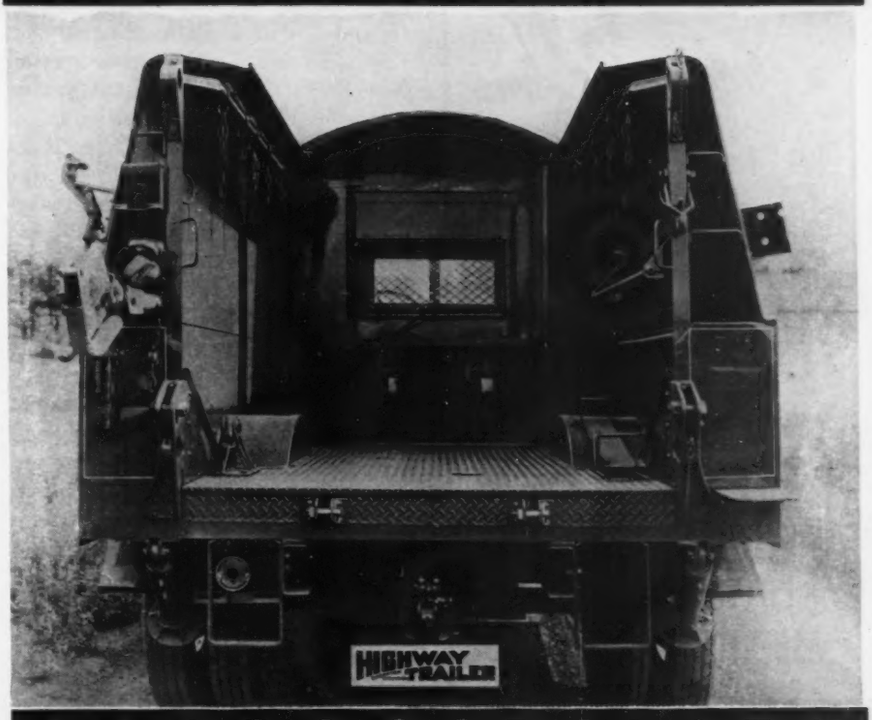
•

EHFA Signs New Wiring and Appliance Contracts

EHFA has announced that contracts had been closed with the Mutual Power & Light Association of Tanner, North Bend, Wash.; Pemiscot-Dunklin Electric Co-operative Hayti, Mo.; city of Russellville, Russellville, Ala.; Fulton County Rural Electric Membership Corporation, Rochester, Ind.; Fillmore County Co-operative Electric Association, Preston, Minn., and the Ontonagon County Rural Electrification, Ontonagon, Mich. Contracts provide for cooperation in financing the sale of electrical appliances.

Contracts have also been closed with the Richland Co-operative Electric Association, Richland Center, Wis.; Carlton County Co-op Power Association, Kettle River, Minn.; Fillmore County Co-operative Electric Association, Preston, Minn., and the Oakdale Co-operative Electrical Association, Oakdale, Wis. Contracts provide for co-operation in financing the wiring or rewiring of homes and farms.

Highway BODIES



ACCESSIBILITY

Every Unit of Space Utilized

No crowding—no confusion—orderly storage of tools and equipment — makes more efficient crews — lightweight, rugged, and durable bodies—highly modern in design—rust resisting, galvannealed metal in the cabinets and panels—bodies last longer—less maintenance needs and costs—a complete line—there's the right type for your needs—standard equipment includes Highway Winches, Derricks, Tools, Racks, etc.—write for descriptive literature.

HIGHWAY TRAILER CO.
EDGERTON WISCONSIN

ROME-CABLE
ROME, N.Y.

Inquiries are solicited for

HOT ROLLED COPPER RODS

BARE and TINNED COPPER WIRE
(In rounds, flats and squares)

BARE and TINNED STRAND

URC WEATHERPROOF WIRE

COTTON, PAPER and ASBESTOS MAGNET WIRE
(In rounds, flats and squares)

RUBBER INSULATED WIRES and CORDS

LEAD COVERED CABLES

NETWORK CABLES

SERVICE ENTRANCE CABLES

ROME "60"

That New Tough 60% Jacketed Heavy Duty Portable Cord

ROME CABLE
CORPORATION
Ridge Street
ROME, N. Y.

SALES OFFICES:
New York Chicago
Cleveland Pittsburgh Boston
Richmond Philadelphia
Los Angeles

Reaching for Better Citizenship

[*Continued from page 28*]

summer attractions were featured at St. Petersburg, Clearwater, Ocala, Orlando, Winter Park, Deland and Eustis. In return 230 communities in New England emphasized the winter appeal of Florida. Each utility aided in the planning of trips to north or south. Cambridge, Plymouth, Portsmouth, Worcester, Framingham and New Bedford in New England carried exchange displays for the Peninsula State. The plan attracted nationwide publicity and gave rise to no little favorable comment. If the scheme continues successful the New England Gas & Electric Association, in conjunction with the Florida companies, contemplates endeavoring an even wider outlet for disseminating information about these vacation resorts.

Assistance in publicity

Whenever required, facilities are offered for assistance in the preparation of various forms of publicity. Last year, in conjunction with the Cape Cod Cranberry Growers Association, the New England Cranberry Sales Company and Cranberry Canners, Inc., a magazine article on cranberry growing, canning and marketing was prepared and published. Another magazine article and a booklet for membership distribution were done in conjunction with the industrial development department of the New Bedford Board of Commerce. Booklets have also been prepared on harbor development at Portsmouth, N. H., and industrial opportunities in that city.

The whole program of community development work by a utility is simple and logical; so simple and logical that it seems strange that our industry has not done more about it in the past. Because of failure to see its opportunities and meet its responsibilities our industry has been criticised and attacked.

Much work ahead

The utility industry has been considered a cold-blooded group of corporations interested only in collecting dollars. Although the actual facts indicate that utilities have achieved much in the way of aiding communities and regions, not enough has yet been done. The work has not been sufficiently general and the program has been too narrow. On the whole the industry has done far too little in the field of broad and unselfish community building.

Time ripe

The times are ripe for programs designed to convince people that the modern utility is a human institution ready to do its share in helping community progress. When the people of a community feel that the operating company is composed of a group of men and women living in the same city or town, neighbors and all good citizens; when they realize that this group is interested in the development of the community and its general welfare; when they see that this group is willing to serve and give as much as or more than most groups, then they will feel that the company is human and a definite power for good in the community.

The cost of this work can be held to a minimum amount, since it is based on utilizing the present personnel rather than setting up any new and intricate organization. There are many employees in our various subsidiary properties familiar with and deeply interested in community affairs. Splendid results have already been demonstrated by the proper encouragement and stimulation of such interest, careful co-ordination, and guiding resultant activity into the most effective channels.

Final analysis

In the final analysis the function of the community development department, division or specialist in the utility organization is to humanize the activities of all the operating units to the end that they share a position of leadership in their communities and gain that which is so needed and which also goes with the job well done—the respect and good will of the people they serve. Participation of the company in civic affairs and the building of the company into the social and economic life of the community bring definite results in good will and improved public relations. Over a period of time such results justify the appropriation to cover their cost, assuming, of course, that the work is planned, as stated, on the basis of a conservative initial coverage of territories and that it develops gradually as its value becomes effective.

Increase Usability of Plant and Substation Capacity

[*Continued from page 37*]

Inside the 13.2-kv. structure is of angle-iron framework covered with furniture steel. Instruments and control devices are mounted on the hinged doors with flexible bundled leads to the wiring duct.

Distribution substation revision in the program is illustrated by the Glendale substation, which appears in accompanying pictures. It was built in 1922 with a capacity of 3,000 kva. to supply six 2,300-4,000-volt Y distribution lines, all equipment housed within the building. In modernizing this substation a walled, but unroofed, addition was built in the rear, in which were installed two 3,000-kva., three-phase transformers, with room for a third. New 13.2- and 4-kv. steel bus structures were erected inside the building wth modern instantaneous reclosing breakers and the size of the 4-kv. cable exits were increased to 350,000 circ.mil. With the addition of 250-amp. voltage regulators this year the reliable capacity of this substation will be more than doubled, thus providing for a considerable growth in load.

•

Columbus Lets Contract

Columbus, Miss., City Council has awarded a construction award to the Richardson Trading Company, Inc., for erection of a new municipally owned electric power distribution system on its bid of $235,819. The new power system will compete with that owned and operated by the Mississippi Power Company, which recently refused $269,000 offered by the city for its system.

•

Savings Total $390,000

Consolidated Edison System employees in Manhattan, Brooklyn, Queens and Westchester County this year saved more than $390,000 in 2,254 Christmas and Vacation Fund Savings Accounts, according to the Edison Savings and Loan Association.

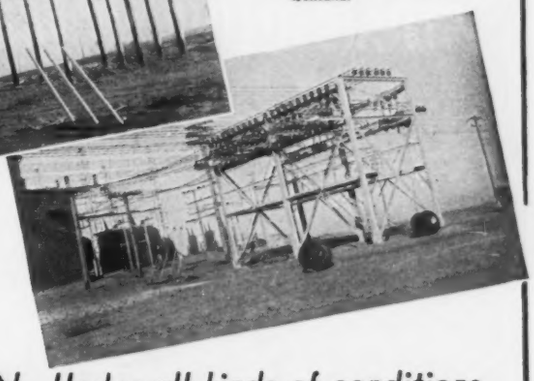
•

October Employment Higher

Figures just compiled by the Maryland Commissioner of Labor and Statistics show that employment in the electrical machinery industry in the state during October was 6.9 per cent higher than in the previous month, but 46.6 lower than in October, 1937.

• *Wood Pole Structure for 6600 v distribution system forming a turn of ninety degrees.*

• *Steel Switching Tower erected at Fort Peck, Montana.*



EXPERTS ON NEW CONSTRUCTION *Under all kinds of conditions*

A. S. SCHULMAN ELECTRIC COMPANY
537 S. Dearborn Street
CHICAGO, ILL.
FOUNDED 1890

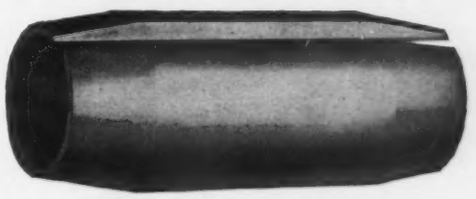
• The Schulman organization of erection specialists has had more than 50 years of experience in power line rehabilitation and construction projects. Trained crews and modern equipment for low-cost construction, in the quickest time, are immediately available. Let us submit quotations and consult with you on your next requirements.

STEEL TOWER • • • WOOD POLE LINE CONSTRUCTION
SWITCHING STRUCTURES • SUBSTATIONS • POWER HOUSES

for EASE . . . ECONOMY . . . EFFICIENCY . . .

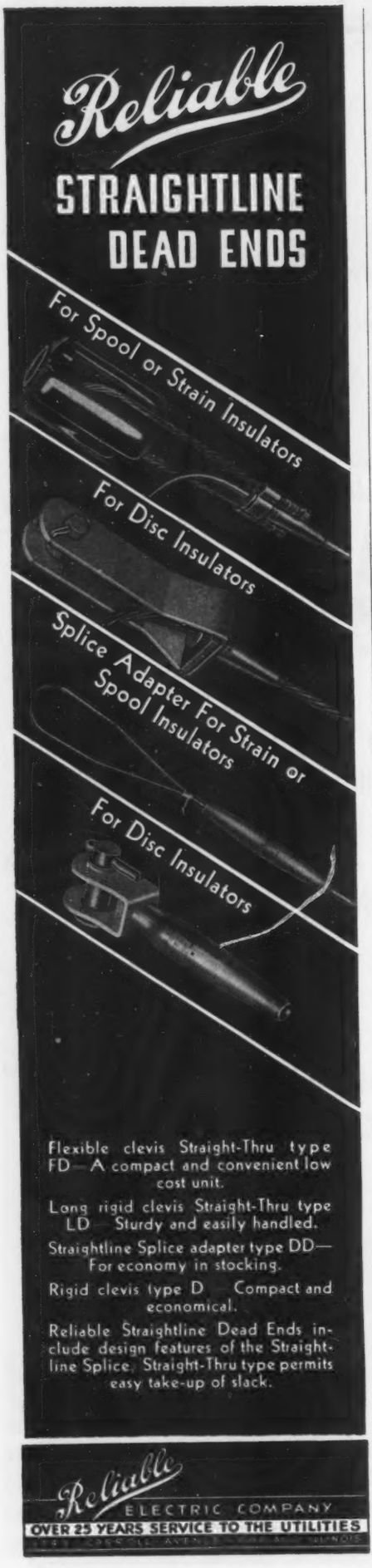
In Making the Underground Splices—Use
NATIONAL Split-Tinned
COPPER CONNECTORS

The use of National Connectors for making the underground Cable splices, saves time, increases accuracy and efficiency and reduces costs. These connectors are made exact to size of the best grade pure soft drawn copper in a size range from 12 B. & S. solid to 2,500,000 C.M. They have a guaranteed conductivity of 98% or better. You'll find that it will pay to standardize on "Nationals" for the underground jobs.



Made to N.E.L.A. Specifications.

THE NATIONAL
TELEPHONE SUPPLY COMPANY
5100 Superior Avenue • • Cleveland, Ohio


Reliable
STRAIGHTLINE
DEAD ENDS
For Spool or Strain Insulators
For Disc Insulators
Splice Adapter For Strain or Spool Insulators
For Disc Insulators
Flexible clevis Straight-Thru type FD—A compact and convenient low cost unit.
Long rigid clevis Straight-Thru type LD—Sturdy and easily handled.
Straightline Splice adapter type DD—For economy in stocking.
Rigid clevis type D—Compact and economical.
Reliable Straightline Dead Ends include design features of the Straightline Splice. Straight-Thru type permits easy take-up of slack.
Reliable
ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES

Condenser Supply Revamped for New Orleans Increment

[*Continued from page 39*]

turbine-driven and two motor-driven, and complement of evaporating equipment.

Operation of the new boiler will be convenient, as the unit is placed adjacent to the previous unit carrying next higher load factor. Turbine operation will not be quite as convenient as if it had been possible to place the new unit in a direct extension to the old turbine hall; however, the additional operating expenses required will be relatively slight. Although the plant will have three different sets of steam conditions, the 200-lb. section will work under very low load factor, largely constituting cold reserve.

In extending an existing station it must be recognized that arrangement cannot be ideal; however, important savings in investment and in certain components of energy production costs obtained by such extension usually quite overbalance any disadvantage.

Condensing water improvements

Reference to Fig. 1 will give an idea of plant history with respect to the handling of condensing water. Early plant utilized 6-ft. pipe "A" in foundation mat for intake and pipe "B" for discharge. About fifteen years ago a new intake, "C," was built several hundred feet upstream from the older structures and a 10 x 10-ft. concrete tunnel carried under railway tracks to the screen chamber; from this a tunnel was run under Market Street, accommodating suction pipes for all units installed in the turbine room at the south side of the plant. After completion of that construction 6-ft. pipes "A" and "B" were both utilized as discharge conduits.

With installation of new unit No. 11 in 1938, it became necessary to extend ("F") Market Street intake tunnel around the corner under South Peter Street and so under the new turbine-room basement. As indicated, space will be available for a future unit (No. 12), and its injection water will be taken from this tunnel extension. Discharge water from unit 11 (and future unit 12) is handled as described below.

Prior to the 1938 extension turbine-condenser units, 5, 6, 7 and 8, aggregating 55,000 kw., discharged into pipe line "B," and units 9 and 10, with combined capacity of 52,500 kw., into pipe line "A." In order to equalize the condensing-discharge flow through lines "A" and "B" it was found best to transfer the discharge of unit 8 from pipe "A" to pipe "B," to construct a special cross-connection under the southeasterly corner of old boiler house, at point "D," and to connect new unit 11 through an existing unused pipe "E," to line "A." Fig. 2 is a sketch of this cross-connection, showing dual pipes welded into lines "A" and "B" beneath the old boiler house floor.

Details of alterations

It was necessary to make special plans to carry out this construction, while maintaining plant operation, briefly as follows:

First step after removal of concrete was cutting two 5-ft. diameter openings in the unused 6-ft. diameter pipe located at the lower level. Following this, properly shaped pieces of steel plate were assembled in place, sections were then welded together and to each of the pipes, to form the complete cross-connections. Later, a portion of plant was shut down over a holiday and discharge pipe "B" unwatered. By a few hours' work two openings were cut in this pipe to complete the connections. After water had been turned into the pipe and welded joints found watertight the plant was put back into service. Concrete was filled around cross-connections and that part of the 6-ft. discharge pipes which had been uncovered. Subsequently, discharge from unit 8 was shifted from line "B" to pipe "A" at elevation 15. With these changes the addition of discharge from the new 30,000-kw. unit does not overload upper discharge line "B."

Before deciding to adopt this arrangement of condensing-water discharge for the new units comparisons were made with various other plans, including the running of a third 6-ft. steel pipe under tracks, connecting into stub pipes provided years ago. The saving by the plan adopted, as compared with any other studied, was approximately $135,000.

•

Board Denies Rehearing

Request for a rehearing in the proceeding in which the petition of the New York State Electric & Gas Corporation for authority to exercise an electric franchise in the town of Cohocton, Steuben County, was denied recently has been filed by the company and also denied by the Public Service Commision. The petition for rehearing, according to the commision, does not contain any allegation as to new evidence in connection with the case.

Washer-Ironer Week Spurs Laundry Sales

Countrywide observance of National Washer and Ironer Week brought October shipments on a parity with 1937 figures for the first time this year and gave the industry its third best month of 1938, J. R. Bohnen, executive secretary of the American Washer and Ironer Manufacturers' Association, has reported.

Marking general increased activity in the home laundering appliance field, August-October washer shipments were 37.5 per cent of this year's ten-month total. Household washers shipped to dealers in October were 115,019, within less than 1 per cent of the October, 1937, total of 116,001. Shipments for the ten months were 985,920, compared to 1,510,756 in 1937.

Ironer shipments are narrowing the margin between 1938 figures and those of last year. The October total was 10,523, a decrease of 15 per cent from a year ago, compared to a decrease of 42 per cent shown by the 1938 ten-month total of 93,104.

•

G.E. New Radio Station

West coast broadcasts of regular U. S. programs over high frequencies will be inaugurated with the completion next February of the General Electric high-power, short-wave broadcast transmitter W6XBE, now being erected on Treasure Island, site of San Francisco's World's Fair. The companion station to the G.E. short-wave stations, W2XAD and W2XAF, in Schenectady will be the first transmitter of its type west of the Mississippi.

•

York Ice Reports Net Loss

Preliminary report of York Ice Machinery Corporation for the twelve months ended September 30 shows net loss of $119,753, after depreciation, interest and all taxes. This compares with a net profit of $957,649 for the twelve months ended September 30, 1937. Current assets as of September 30 amounted to $8,646,341 and current liabilities were $1,436,279.

•

Permitted to Sell Land

Connecticut River Power Company has been granted authority by the New Hampshire Public Service Commission to sell 2,600 acres of land in Pittsburg and Clarkesville, N. H., to the New Hampshire Resources Board for $135,755. The land will be utilized in connection with the construction of a dam at Pittsburgh for flood control.

BURNDY

Expansion Connectors

protect the insulated bus structure against damage due to thermal expansion, settling foundations, mechanical shock and similar strains.

Illustrated — three Burndy Expansion Terminals (type XFE) installed on 4" IPS transformer risers.

BURNDY ENGINEERING CO., INC. • 459 E. 133 St., N. Y. C.

VICTOR INSULATORS, INC.

VICTOR, N. Y., U. S. A.

McGRAW-HILL DIRECT MAIL LISTS

AS business paper publishers for over 50 years, McGraw-Hill is uniquely equipped to offer complete, authoritative direct mail coverage of Industry's major markets. Extreme accuracy is maintained (guaranteed to 98%) and through careful analysis of markets, complete classification of companies and personnel, etc., the widest possible selections are available. Send for handy reference folder "Hundreds of Thousands of Reasons Why" which describes how McGraw-Hill Lists are built and maintained.

What Fields Do You Want to Reach?

Aviation Industry
Bus & Transit Industries
Business Executives
Chemical Process Industries
Civil Engineering & Construction
Coal Mining
Electrical Appliance Dealers
Electrical Contractors
Electrical Industry
Electrical Wholesalers
Food Industries
Manufacturing Industries
Metal Mining
Metal Working Industries
Mill Supply Distributors
Power Engineers
Product Engineers
Radio Dealers & Wholesalers
Radio Engineers
Textile Industries

For further details, selections from above basic classifications, counts, prices, etc., or estimates on special lists . . . ask any representative or write to

DIRECT MAIL DIVISION
McGRAW-HILL PUBLISHING CO.
330 W. 42nd STREET NEW YORK, N. Y.

. . . Complete Lists Covering Industry's Major Markets

Sales Opportunities

CHATTANOOGA, TENN. — Chattanooga Electric Power Board, L. J. Wilhoite, chairman, plans call for bids early in January; to close about January 25, for new power substations Nos. 2 and 4; site for latter has been selected at Polk and 36th Streets. Also for necessary station equipment, lines, connections and accessory installation.

BURNET, TEX.—Has plans under way for new municipal electrical distributing system, including transmission line for connection with high-tension system of Lower Colorado River Authority, which will furnish power, connecting with substation to be built at city limits for step-down service. Cost about $108,000, of which $60,000 will represent a bond issue, recently voted, and remainder secured through Federal aid. J. W. Beretta Engineers, Inc., National Bank of Commerce Building, San Antonio, Tex., is consulting engineer.

BREMERTON, WASH.—Bureau of Yards and Docks, Navy Department, Washington, D. C., receives bids until December 28 for equipment for power plant at Puget Sound Navy Yard, including boiler unit of 400 pounds gauge pressure with capacity of 125,000 lb. of steam per hour, boiler setting with water-cooled walls, oil-burning equipment, superheater, air preheater, water heaters, pumps, mechanical fans, air and gas flue ducts, soot blowers, continuous blow-down system, feedwater treatment equipment, combustion control system, and complete wiring and piping systems (Specifications 8821).

CASCADE, IOWA—Receives bids until December 26 for new municipal electric power plant, including equipment. Also for electrical distribution system. Cost about $110,000. Financing has been arranged through federal aid. Young & Stanley, Inc., 211 Iowa Avenue, Muscatin, Iowa, is consulting engineer.

LUFKIN, TEX.—Southland Paper Mills, Inc., organized a few months ago, has plans maturing for new local mill for production of newsprint, with installation to include motors and controls, regulators, transformers and accessories, conveyors, loaders and other equipment. A power plant will be built, equipped to use natural gas as fuel. Company has arranged for loan of $3,425,000 through RFC and will carry out additional financing to develop total amount of $5,040.000 for project. Initial units are scheduled for completion late in 1939. George F. Hardy, 305 Broadway, New York, N. Y., is consulting engineer. Ernest L. Kurth is president. Perkins-Goodwin Company, 30 Rockefeller Plaza, New York, paper products, is interested in Southland company.

NEW CASTLE, PA.—Pennsylvania Power Company, Youngstown, Ohio, will begin work soon on construction of proposed new power plant at New Castle, where tract of land was acquired a number of months ago. Extensions will be made in transmission lines and distributing system in that area, including power substation facilities.

CROSBYTON, TEX.—Has plans nearing completion for new municipal electric power plant and electrical distributing system. Cost about $94,000. Financing has been arranged through Federal aid. Municipal Engineering & Finance Company, Mercantile Bank Building, Dallas, Tex., is consulting engineer and will issue call for bids soon.

HASTINGS, NEB. — Central Nebraska Power and Irrigation District, St. Joseph and Third Streets, Hastings, receives bids until December 30 for power substation at Johnson Canyon generating plant No. 1 (Group 23-D), and for power substation at Johnson Canyon generating station No. 2 (Group 24-D), including transmission line to Johnson waterway structure, in conjunction with bids for main power plant structures, closing at same time, as previously noted in these columns. Also for switchboards and switchgear for Jeffrey Canyon power plant, and Johnson Nos. 1 and 2 generating stations, including metalclad switchgear, neutral oil circuit breakers, current transformers, disconnecting switches and accessories (Group 108); nine and ten-panel switchboards for main control at Johnson Nos. 1 and 2 stations, exciter air circuit breakers, storage battery, battery charger and miscellaneous equipment (Group 109); seven single-phase, 3,333-kva. main power transformers for Jeffrey plant; three single-phase, 6,667-kva. main power transformers for Jeffrey plant; three single-phase, 6,667-kva. main power transformers for Johnson No. 2 station (Group 110); four three-phase, 115-kv. station-type lighting arresters for three stations noted (Group 111); 14 115-kv., 600 amp., 500.000-kva. interrupting capacity oil circuit breakers for three plants noted (Group 112), and for 44 115-kv., 600-amp. gang-operated disconnecting switches for the three plants noted (Group 113). George E. Johnson is chief engineer and general manager.

WHITEVILLE, TENN.—Has plans for municipal electrical distributing system, with transmission line for connection with high-tension system of TVA, which will furnish power supply. A power substation will be built in municipality for step-down and distribution service. Bond issue of $50,000 has been authorized and further financing will be arranged through federal aid.

WYTHEVILLE, VA. — Mountain Empire Hosiery Mill, Inc., care of J. C. Dobson, Pulaski, Va., president, Dobson-Miller Corporation, Pulaski, recently organized by Mr. Dobson and associates, plans installation of motors and controls, regulators, conveyors and other equipment in group of five new hosiery mills to be built in different parts of state. Sites are being acquired in Lee, Russell, Washington and other counties. Entire project will cost over $600,000. Homer K. Bowen and Percy S. Curry, Wytheville, are interested in new company.

CLINTON, MICH.—Is completing plans for extensions and improvements in municipal electric power plant, including installation of addition equipment. Cost about $120,000. Fargo Engineering Company, Jackson, Mich., is consulting engineer.

ELGIN, ILL.—Winnebago Distillery Company, 105 West Monroe Street, Chicago, Ill., plans power plant at new distillery on site recently acquired near Elgin; also will build a power substation for industrial service, with installation of transformers, switchgear and accessories. Equipment installation in distillery buildings will include motors and controls, conveyors, electric hoists, loaders and other apparatus. Plant will comprise several large units and is estimated to cost about $700,000. Paul Gerhardt, 457 West Fullerton Avenue, Chicago, is architect.

QUINCY, MASS.—Proctor & Gamble Company, Gwynne Building, Cincinnati, Ohio, manufacturer of soaps, washing powders, edible oils, etc., plans installation of motors and controls, regulators, conveyors, electric hoists, loaders and other equipment in new branch plant at Quincy, where tract

of about 10 acres of waterfront property has been acquired. A power house will be built. Plant will comprise several large one and multi-story units, and is estimated to cost close to $1,000,000. Work is scheduled to be carried out early in coming year.

•

Recent Rate Changes

PENNSYLVANIA POWER & LIGHT COMPANY has been ordered by the state Public Utility Commission to reduce its rates annually $2,300,000 and to eliminate 100 rate schedules. The commission said the company had agreed not to appeal the order, which affects 367,000 customers in 29 counties. The bills of 92 per cent of the customers will be reduced beginning on January 1.

CALIFORNIA RAILROAD COMMISSION has announced the details of the reduced rates on the San Diego Consolidated Gas & Electric system. The new rates will save customers $168,000 annually. At 15 kw.-hr. of monthly domestic usage the rate remains unchanged. The cost of 50 kw.-hr. per month is reduced from $2.34 to $2.23, of 100 kw.-hr. from $3.59 to $3.43 and of 250 kw.-hr. from 6.84 to $6.58. This will be the fifth major reduction in the company's electric rates in the last four years. To small domestic consumers, these have represented savings of more than 25 per cent.

SCRANTON ELECTRIC COMPANY announced a new schedule of rates, effective December 1, for 86,000 consumers in Lackawanna Valley. Consumers will realize a net saving of approximately $600,000 annually. Small consumers had minimum tariffs cut from $1 to 50 cents, while the 3 per cent penalty for delinquent payments was abandoned, as an experiment. Besides cutting the rates to business houses and private consumers, the company also reduced tariffs to cities and boroughs for street lights. All homes using 200 kw.-hr. or more a month will be able to buy energy in excess of 200 kw.-hr. at 1½ cents per kilowatt-hour. The reduction was made voluntarily and not under order of the State Utility Commission.

FLORIDA POWER & LIGHT COMPANY'S new electric rate schedules, recently submitted to the Miami City Commission, will become effective in other cities served by the company, Bryan C. Hanks, president, has announced.

OKLAHOMA GAS & ELECTRIC COMPANY has been authorized by the Arkansas Utilities Commission to withdraw certain wholesale power and street lighting schedules under which no customers were being served, and to amend its commercial lighting rates for rural territory.

WISCONSIN PUBLIC SERVICE COMMISSION has announced that electric utility customers will save about $13,000 annually as the result of rate reductions ordered or authorized during October.

ADAMS ELECTRIC LIGHT COMPANY has filed with the New York Public Service Commission a reduction of rates for commercial service other than lighting which is estimated to save customers of the company about $3,200 annually. The newly filed rate available for general commercial use other than lighting is a minimum charge of $1 per meter per month and $1 per horsepower of motor load. Ten horsepower of motor load is permitted under the rate. The energy charges of the newly filed rate is 4 cents per kilowatt-hour for the first 50 kw.-hr., 3 cents per kilowatt-hour for the next 150 kw.-hr. and

TRICO COLORTOP SHOCKPROOF FUSES

YOU CAN'T GO WRONG WITH COLORTOPS!

They are recognized generally as the accepted standard of comparison for QUALITY — SERVICE and DEPENDABILITY.

COLORTOPS cost no more but you get all of these . .

PLUS VALUES . . .

- Color rating indicator
- Porcelain shock-proof top
- Vent-proof top (no burns)
- Clear Mica Window
- Large center contact rivet
- Distinctive modern design
- Porcelain construction (no carbonizing)
- All soldered connections
- Guaranteed accuracy
- Rigid factory inspection
- Underwriters' label on each fuse

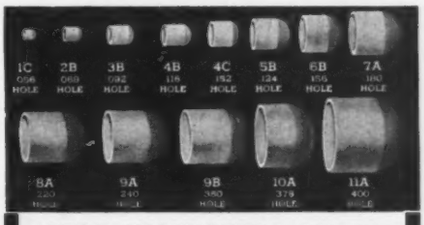
WRITE FOR FREE SAMPLE

TRICO FUSE MFG. CO.
MILWAUKEE WISCONSIN

K-P-F

Self-aligning, self-releasing, full-floating, SILVER-PLATED contacts insure permanent ease of operation.

K-P-F ELECTRIC CO.
855 Howard St., San Francisco



STAR INSULATING BEADS

Use Lavolain ball and socket beads for insulating bare wire. Heat resistant. High di-electric and mechanical strength. Made in U. S. A. Quality beads at low cost. Quickly applied. Flexible. Beads shown above are approximately half actual size. Ask for price list and samples.

STAR PORCELAIN CO.
TRENTON, N. J.

Your name stamped in Gold on this book FREE

At no additional cost to you, we will stamp your name, or a friend's name, in gold on the front cover of any copy of Standard Handbook for Electrical Engineers ordered from this advertisement. This is a special Christmas offer, limited to acceptance before January 1, 1939.

STANDARD HANDBOOK FOR ELECTRICAL ENGINEERS

Editor-in-Chief, Frank F. Fowle, Consulting Engineer — Assisted by 91 specialists

Sixth Edition—2816 pages

THE latest edition of one of the world's leading technical reference manuals. Its 28 big sections, each written by one or more recognized specialists, cover every phase of electrical engineering, giving a wealth of standards, data, description and practice in remarkably compact yet accessible form.

Do you want to make a friend a gift combining personal thoughtfulness with real utility? Do you want a copy of this big Handbook that you will doubly prize? Then take advantage of this free stamping offer. Send the coupon today. (Proper remittance should be enclosed with order and of course, stamped copies are not returnable.)

SPECIAL HOLIDAY OFFER COUPON

McGraw-Hill Book Co., Inc., 330 W. 42nd St., N. Y. C.

Send me Standard Handbook for Electrical Engineers according to the terms checked:

☐ With name stamped in gold. I enclose $7.00 and understand that stamped books are not returnable. (Offer expires Jan. 1, 1939.)

☐ For 10 days' examination; without gold stamping. I will send $7.00 plus few cents postage in 10 days or return book postpaid. (Postage paid if cash accompanies order.)

Print name to be stamped, here

Name .....

Address ..... Position .....

City and State ..... Company .....

(Books sent on approval in U. S. and Canada only.) W. 12-17-38

PROFESSIONAL SERVICES

Consulting
Accounting
Valuations

Management
Appraisals
Construction

Designing
Testing
Financing

Inspections
Cost Analysis
Investigations

WILLIAM A. BAEHR ORGANIZATION, INC.
ENGINEERS—ACCOUNTANTS—MANAGERS
231 South La Salle St.
CHICAGO

E. T. L.
TESTS
Electrical, Chemical, Mechanical, Photometric
INSPECTIONS RESEARCH
Materials and Supplies Private Labs. for Clients
Electrical Testing Laboratories, New York, N. Y.

DANIEL W. MEAD
F. W. SCHEIDENHELM
Consulting Engineers
Hydro-Electric Development, Dams, Water Supply, Flood Control. Engineering Problems relating to Water Rights and Water Power Law. Appraisals.
New York City, 50 Church St.

BARKER & WHEELER
Utility and Industrial Valuations, Design and Construction of Power Systems, Water Supplies, Sewerage and Sewage Disposal, Factory Production and Cost Control Systems.
11 Park Place, New York City
36 State Street, Albany, N. Y.

FORD, BACON & DAVIS, Inc.
Engineers
DESIGN • CONSTRUCTION
VALUATIONS • REPORTS • INTANGIBLES
Philadelphia New York Chicago
Washington Dallas

Recording & Statistical Corp.
BILL ANALYSES—CONSUMPTION STUDIES
THE ONE-STEP METHOD
Bill Frequency Analyzer
102 Maiden Lane New York

BLACK & VEATCH
Consulting Engineers
Water, Steam and Electric Power Investigations, Design, Supervision of Construction, Valuation, Tests and Laboratory Service.
Mutual Building, Kansas City, Mo.

FRANK F. FOWLE & CO.
Electrical and Mechanical
ENGINEERS
35 East Wacker Drive Chicago, Ill.

SANDERSON & PORTER
ENGINEERS
for the
FINANCING—REORGANIZATION—
DESIGN—CONSTRUCTION—
of
INDUSTRIAL and PUBLIC UTILITIES
Chicago New York San Francisco

EDWARD J. CHENEY
ENGINEER
PUBLIC UTILITY PROBLEMS
61 Broadway New York

HOOSIER ENGINEERING COMPANY
Erecting Engineers
Transmission Lines, Substations
46 So. 5th St., Columbus, Ohio
431 So. Dearborn St., Chicago, Ill.
136 Liberty St., New York

SARGENT & LUNDY
Incorporated
ENGINEERS
140 South Dearborn St.
Chicago, Ill.

HUGH L. COOPER & CO.
General Hydraulic Engineering, including the design, financing, construction and management of hydro-electric power plants.
101 Park Ave. New York

HARRY L. KNEISLY
Consulting Engineer
Distribution - Transmission - Substations
1523 Palm Street Reading, Pa.

SPOONER & MERRILL, INC.
Consulting Engineers
Design—Supervision of Construction
Reports—Examinations—Valuations
20 North Wacker Drive, Chicago, Illinois

ROBERT E. FOLEY
Erecting Engineer
Rural Lines—Transmission Lines
Fire Alarms—Telephone Lines
48 Griswold St. Binghamton, N. Y.

WILLIAM S. LEFFLER
succeeding
CHARLES F. LACOMBE—WILLIAM S. LEFFLER
Engineers — Economists
Public Utility Management Problems
Economic Audits for Selective Load Building
Balanced Domestic Load Development
Cost Analysis—Rate Cases
30 East 42nd Street—New York

STEVENS & WOOD
Incorporated
ENGINEERS AND CONSTRUCTORS
30 Broad Street New York

CARDS ON THIS PAGE
of Professional Services
are available at a cost that is negligible considering the possible clientele contacted. Rates on request to
Departmental Advertising Staff
ELECTRICAL WORLD, 330 W. 42nd St., N. Y.

LUCAS & LUICK
ENGINEERS
Power Plants Transmission Lines
Industrial Plants
Examinations Reports Valuations
Rate Cases
Public Utility Management
231 So. La Salle St., Chicago

THE J. G. WHITE ENGINEERING CORPORATION
Engineers—Constructors
Steam and Hydraulic Power Plants
Transmission System—Substations
REPORTS AND APPRAISALS
80 Broad Street New York

for that speech...

get the material you need, from Hoffman's
THE PUBLIC SPEAKER'S SCRAPBOOK
Presents hundreds of selected beginnings, endings, provocative paragraphs, illustrations, anecdotes, etc., to build up your speech for any occasion. Also helpful hints on speaking. Send $2.50 for a copy on 10 days' approval.
McGraw-Hill Book Co., Inc. 330 W. 42nd St., New York City

2 cents per kilowatt-hour for use in excess of 150 kw.-hr. per month.

TWIN STATE GAS & ELECTRIC COMPANY has filed a revision of electric rates with the New York Public Service Commission establishing an additional commercial rate in its territory. The commission permitted the change to become effective on January 1 and it is estimated that the transfer of customers to the new rate will result in a saving of approximately $1,600 annually.

•

Municipal Plants

GREEN COVE SPRINGS, FLA.—City commissioners have voted to discontinue operation of the city's municipal power plant. In the future electric power will be purchased at wholesale rates from Jacksonville and retailed to citizens.

COEUR D'ALENE, IDAHO—Federal Judge C. C. Cavanah has under advisement petition of the city and the PWA for modification of a federal injunction preventing the city from accepting PWA funds for a municipal power plant. The injunction was granted in 1935 at the request of the Washington Water Power Company, which serves the city. The utility contended a provision regulating rates in the 1935 agreement would force it from business and $475,000 proposed for the project was insufficient for construction of necessary plant. In recent oral arguments the city and PWA contended former objections had been met in a new contract. Judge Cavanah said he would withhold decision until receipt and study of written briefs.

WATERVILLE, KAN.—At a recent meeting city council voted to postpone indefinitely plans for a power generating unit and new municipal power plant building. PWA funds had been allotted for the proposed $34,500 project.

THAYER, MO.—Missouri Public Service Commission had authorized the Arkansas-Missouri Power Company to discontinue its electric service now that the town has a municipal plant in operation. The company sought to remove its system last spring, but was ordered not to do so by the commission. The Mayor now has no objection to the application filed by the company in October, seeking permission to discontinue. The city plant was completed during the summer.

MINATARE—Competition is one of the risks pertaining to every business that is not protected by a monopoly, the United States Circuit Court of Appeals declared in a recent opinion, in which it held the city has the right not only to lease its electrical distribution system to a public utility, but also has the right to install a competing plant. The opinion, handed down by Judge A. K. Gardner, upheld the decision of a Nebraska lower court in dismissing the application of the Western Public Service Company to restrain the city from building a municipal plant. The utility contended its predecessor had leased from the city its electric distribution system, and that the lease will not expire for seven years. The company further contended it had built a transmission line to the city at a substantial expense and reduced rates for furnishing electricity to the city. It maintains the municipal system would violate the lease. The Appeals Court held neither the lease nor the franchise conferred on the utility the exclusive right for license to maintain and operate the electric light and power system.

MIDDLETOWN, OHIO—Following the refusal of the Cincinnati Gas & Electric Company to accept an offer of $815,747 tendered by the city council for purchase of the local electrical distribution system of the company for future municipal operation, H. C. Blackwell, president of the company, has requested that City Solicitor Fred J. Schatzmann file a petition for an injunction on the grounds that an ordinance passed by the City Council was not an emergency measure. The Council on November 18 authorized the issuance of twenty-year term mortgage revenue bonds in amount of $1,800,000 to defray the city's share of the proposed municipal power plant and distribution system. It is contended, also, that the bonds should be of a serial character in conformance with the Uniform Bond Act of the state. If such action as requested is not taken immediately by the city solicitor, the power company proposes to ask the injunction in its own name.

CUERO, TEX.—By a vote of 511 to 426, taxpayers of the city in a recent election approved the proposal to issue revenue bonds to buy or build a municipal light and power system and to purchase power from the Lower Colorado River Authority. In a previous election, the proposal was defeated.

WYLIE, TEX.—Decision to withdraw its PWA application for a municipal electric light plant and to continue to receive service from the Texas Power & Light Company has been reached by City Council. Texas Power & Light Company has served the city since 1916 and in that period has reduced residential service rates eight times. The city had voted in favor of a municipal light plant September 29.

FORT WORTH, TEX.—Petitions, bearing 11,861 names, were submitted to the City Council at a recent meeting, demanding an election to vote on municipal ownership of the light and gas systems. The petitions were presented by Attorney Karl Crowley. No action was taken on the petitions by the council. The petitions seek an election on amendment of the city charter to provide for issuance of revenue bonds for acquisition of systems for distribution of electric energy and gas.

Contemplating the purchase of power from the Lower Colorado River Authority, the light and power amendment would authorize the issuance of not more than $5,000,000 in bonds for construction or purchase of a distribution system.

PALESTINE, TEX.—Petitions have been presented to the City Council asking a vote on the question of issuing $550,000 in revenue bonds to buy or install a municipal power plant. Proposal calls for the purchase of the plant of the Texas Power & Light Company, if it can be acquired at a reasonable price, or installation of a new system on a competitive basis.

PROVO, UTAH—Construction of the proposed municipal power plant will proceed despite a Utah supreme court order directing city officials to place before the electorate an ordinance proposing to repeal earlier ordinances which authorized financing of the projected power and light unit, Mayor Mark Anderson has announced. "Although we will abide by the Supreme Court's order and call immediately for bids for printing initiative petition copies, we also shall proceed with the construction of our proposed municipal plant, as there is no court order restraining such procedure," the Mayor said. An application is now before PWA officials in Washington for a grant to construct a local municipal plant, costing approximately $1,000,000.

Crapo
GALVANIZED PRODUCTS
Steel Strand
Telephone and Telegraph Wire
Where strains and stresses are heaviest, where corrosion takes its greatest toll, Crapo Galvanized Steel Strand and Telephone Wire constantly are proving their outstanding superiority. The heavy, tenaciously bonded zinc coating, maximum tensile strength and correct ductility insure longer life and lower maintenance cost. Insist upon Crapo Galvanized Products for better performance under all conditions! Ask your Jobber or write direct!
INDIANA STEEL & WIRE CO.
MUNCIE, • INDIANA
Crapo Galvanized Strand and Telephone Wire can be obtained readily in all standard grades and sizes.
INDIANA STEEL & WIRE CO.
MUNCIE, IND.

HIGH GRADE
HARD PORCELAIN
FOR
Electrical Specialties
High and Low Voltages

IMPERIAL
PORCELAIN WORKS
TRENTON, NEW JERSEY

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT : "OPPORTUNITIES" : EQUIPMENT
BUSINESS : : USED OR RESALE

UNDISPLAYED — RATES — DISPLAYED

10 CENTS A WORD. MINIMUM CHARGE $2.00

Positions Wanted (full or part time salaried employment only) ½ the above rates payable in advance.

Box Numbers—Care of publication New York, Chicago or San Francisco offices count as 10 words.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Individual Spaces with border rules for prominent display of advertisements.

1 inch $7.00
2 or 3 inches..... 6.75 per inch
4 to 7 inches..... 6.50 per inch
8 to 14 inches..... 6.25 per inch

An advertising inch is measured vertically on a column—3 columns—30 inches to a page. Contract rates on request.

POSITIONS VACANT

IMMEDIATE openings for Executive Electrical Engineers, Fractional H.P. Motor Designers, and Distribution Engineers. Write for application. Harrison Personnel Service, 20 W. Jackson Blvd., Chicago.

EMPLOYMENT SERVICE

SALARIED POSITIONS. $2,500 to $25,000. This thoroughly organized advertising service of 29 years' recognized standing and reputation carries on preliminary negotiations for positions of the caliber indicated above, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by a refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If your salary has been $2,500 or more, send only name and address for details. R. W. Bixby, Inc., 270 Delward Bldg., Buffalo, N. Y.

EXECUTIVES AND TECHNICAL MEN. Contact employers for positions through our confidential and effective methods. The negotiate preliminary overtures. Established 24 years. Inquiries invited. H. H. Harrison, Director, The National Business Bourse. 20 West Jackson Blvd., Chicago.

POSITIONS WANTED

SUPERVISING ELECTRICAL DRAFTSMAN, thoroughly experienced in design and drafting of generating stations and all types of substations. Fourteen years' experience. At present employed as chief electrical draftsman for large Eastern utility. Desires more advantageous connection. PW-567, Electrical World, 330 W. 42nd St., New York, N. Y.

A-1 TRANSFORMER MAN. Broadly experienced, U.S.A. and Canada, including shipping, installation and servicing. Best of references furnished. H.S.G., 318 High St., Newark, N. J.

ELECTRICAL ENGINEER. Twelve years design, estimating, purchasing, field engineering, correspondence, negotiation of contracts, with nationally operating firm of electrical engineers and constructors on industrial plants, substations, power plants, overhead and underground distribution. Six years power plant operating experience. Technical graduate, also business administration and knowledge of Spanish. Desires permanent responsible connection with established industrial, utility or engineer. Age 40, married. PW-573, Electrical World, 520 N. Michigan Ave., Chicago, Ill.

BUSINESS OPPORTUNITY

Excellent Opportunity

For individual or concern wishing to enter the Canadian Field. Senior partner returning to Europe. $15,000.00 gives controlling interest in one of the larger and best equipped electrical and mechanical repair plants in Montreal, Canada. Having valuable following in the industrial, manufacturing and paper mills. Contracts and Agencies, etc. BO-571, Electrical World, 330 W. 42nd St., New York, N. Y.

WANTED

A number of Demand Meters AC and DC Sangamo, Gen. Elec. or Westinghouse. W-572, Electrical World, 330 W. 42nd St., New York, N. Y.

OFFICIAL PROPOSALS

Bids: January 3 (51)

Regulating Transformers

LEGAL NOTICE TO BIDDERS
REGULATING TRANSFORMERS
P.W.A. Project Docket No. Tenn. 1105-P-DS
Electric Distribution System
SUB-PROJECT—CONTRACT NO. 3-D
ELECTRIC POWER BOARD OF CHATTANOOGA
Chattanooga, Tennessee

Sealed proposals for the manufacture and delivery of Sub-Project—Contract No. 3-D of the Electric Power Board of Chattanooga, acting for and on behalf of the City of Chattanooga, Chattanooga, Tennessee,

P.W.A. Project Docket No. Tenn. 1105-P-DS
Electric Distribution System

SUB-PROJECT—CONTRACT NO. 3-D

will be received by the Electric Power Board of Chattanooga, Chattanooga, Tennessee, at the office of the Secretary of the Electric Power Board of Chattanooga, Municipal Building, Chattanooga, Tennessee, until 1:30 P. M. on the third day of January, 1939, and will be immediately publicly opened and read by the Electric Power Board of Chattanooga.

Copies of the Proposal, Contract Documents and Specifications may be obtained from the office of the Electric Power Board of Chattanooga, Municipal Building, Chattanooga, Tennessee. A deposit (certified check) of twenty-five ($25) dollars will be required for procuring the Proposal, Contract Documents and Specifications. The deposit for these documents will be returned to all except the successful bidder upon the return of the documents in good condition within ten (10) days after the bids are opened.

A copy of the Proposal, Contract Documents and Specifications may be examined free of charge at the Chamber of Commerce and the office of the Electric Power Board of Chattanooga, Chattanooga, Tennessee.

Each bid must be accompanied by a Certified Check, or Bidder's Bond executed by the bidder and a surety company licensed to do business in Tennessee, in the sum of ten (10%) per cent of the amount of the bid. The bond is required as a guarantee that if the bid is accepted, a contract will be immediately entered into and the performance of it properly secured. The successful bidder will be required to execute a Performance Bond in the amount of one hundred (100%) per cent of the contract price. This Performance Bond shall be made through a Company having a duly authorized representative in Chattanooga, Tennessee, upon whom process may be served.

All items in the proposal form and on data sheets must be properly filled out and must not be detached from the specifications. No qualifying letters or statements will be considered.

Bidder's name must be placed on the envelope containing this document and also upon this envelope shall be designated the name and contract number which the bid covers.

WITHDRAWAL OF BIDS: Bidders may withdraw bids at any time prior to the opening, but thereafter no bidder may withdraw a bid submitted for a period of sixty days after the date set for the opening of such bids.

The estimated cost of the equipment of the Project covered by this contract is $38,000.00.

The Electric Power Board of Chattanooga, Chattanooga, Tennessee, reserves the right to reject any and all bids, and to waive informalities therein.

Any bid received after the scheduled closing time for receipt of bids will be returned to the bidder unopened.

ELECTRIC POWER BOARD OF CHATTANOOGA
Chattanooga, Tennessee
By L. J. WILHOITE, Chairman
J. C. TWINAM
G. H. PATTEN
STANTON E. SMITH
Will F. Chamlee, Counsel.
Attest:
N. J. Simmons, Secretary.

OFFICIAL PROPOSALS

J. P. MANYPENNY
212 N. 21st St., Phila., Pa.
Rebuilt
OIL CIRCUIT BREAKERS

This week's specials:—

1—G.E. Co. type FK-34, 2000 amp., 4500 volt three pole—(NEW), hand or solenoid operated.

1—G.E. Co. type FK-25, 3000 amp., 2500 volt three pole, motor operated.

Prices on application.

Send us your inquiries

GENERATORS — MOTORS

2—**D. C. Generators** class 6-50-290 connected to Harrisburg Engines
1—**D. C. Generator,** class 6-50-290, Fleming Engine
1—**D. C. Generator,** class 6-500-900, Curtis Steam Turbine
6—Type FTR—3 ph. 60 cy. 440 v. 10 HP. **Motors**
3—Type FTR—3 ph. 60 cy. 440 v. 15 HP. **Motors**
2—Type FTR—3 ph. 60 cy. 440 v. 20 HP. **Motors**

CONVERTER

1—Synchronous **Converter**—25 cy. 8-2000-375 v. 650 with air cooled transformer.

Boston Iron & Metal Co.
313 S. Hanover St., Baltimore, Md.

60 K.W. RECTIFIER

General Electric, Phanatron Rectifier, like new. Direct current output 600 volt, 100 ampere. Complete with 2 tubes, transformers, etc. **$450.00.**

ELECTRICAL SURPLUS CO.
1885 Milwaukee Ave. CHICAGO

WANTED
MOTOR GENERATOR SETS
AND ROTARY CONVERTERS

We will buy outright for spot cash motor generator sets and rotary converters from 300 to 1000 K.W. 250-275 volt D.C. 2300 to 6600 volt A.C. Mail us your list of surplus equipment.

COAL MINE EQUIPMENT SALES CO.
Office and Warehouse Terre Haute, Indiana

MOTOR WANTED

1—150 HP, 375 RPM, 50 Cycle, .8PF 440 volt, 3 PH, Synchronous Motor with Exciter for use on Pacific Coast.

Address PO Box 29 Mishawaka, Ind.

Notice to Advertisers

Because of the Christmas Holiday, December 26th, the "Searchlight" pages of the December 31st issue of

ELECTRICAL WORLD

close for press earlier than the usual closing time.

The cooperation of advertisers is solicited in forwarding new copy, or changes of copy, to reach us accordingly.

FINAL CLOSING TIME
DISPLAY AND UNDISPLAYED ADS:
FRIDAY 10 A.M.
DECEMBER 23RD